

amateur radio

NOVEMBER, 1974



Despite a lot of talk recently that the component industry in Australia is finished, at least one factory in Melbourne is in full production of capacitors. This particular machine is winding metallised paper capacitors for the telephone industry.

Photo: VK3ACA

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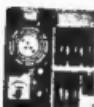
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SPECIAL INSERTS —

Oscar 8 Standard Orbits	
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**GRID DIP METER
SPECIFICATION****Model TE-15**

Freq. Range: 440kHz-280MHz
in 6 Coils:
A Coil 0.44-1.3MHz
B Coil 1.3-3.5MHz
C Coil 4.14MHz
D Coil 14.40MHz
F Coil 120-280MHz
Transistor: 1N34A, 1N384, 1N399, 1N399A
Meter: 500μA F.s.
Battery: 9V (BL-006P)
Dimensions: 180x60x40mm
Weight: 730g

Price \$36.50
P & P \$1.00

**Model HE-22D
Model TE-22D**

Freq. Range: Sin: 20Hz-200kHz
Square: 20Hz-25kHz
Output Voltage: Sine: 1 volt
Square: 7 volt
Output Impedance: 1000 ohm
Freq. Accuracy: +3%/-2%
Distortion: Less than 2%
Tube Complement: 88MB
12AT7
Power Source: 105-125, 220-
240V A.C. 50/60 cps. 19W
With Attenuation Range
4 Ranges—1/1, 1/10, 1/100,
1/1K

**DELUXE
AUDIO GENERATOR
SPECIFICATION**

Compact-Source Saving
Printed Circuit for uniform
Characteristics.
Low Distortion
Dimensions: 140 x 215 x 170mm
Weight: 2.8kg.

Price \$49.50
P & P \$2.00

Disposal Specials — Richmond only**Crystals**

1 MHz D style es. \$8.00
100 kHz 7 pin glass enclosed \$10.00
Most popular D style for 2 FM channels 1, 4, B, 50 etc. \$6.50
58 ohm new $\frac{1}{2}$ " diameter coax cable \$10.00
12c/yd or 100 yd

Tank whip antenna bases, new
Selsyn motors, 50 volt, new
PMG phone plug and socket,

Ericsson type, per pair
Phone curly cords, cream
Rocking armature mic, insert
Key switches, various types, 50c & 75c

4/125a Ceramic valve socket
7 pin PTFE valve socket with screw-on shield \$2.00
9 pin as above

Polypak 100 mixed resistors $\frac{1}{2}$ W-2W all new \$1.00
Polypak 30 assorted capacitors, ceramic, electrolytic polyester, all new \$1.50

Switches, 11 position, 2 pole, 2 bank ceramic \$1.50
Switches, 4 position, 2 pole \$1.00

8 transistor radio circuit board with all components and battery holder ready to go straight from production line \$3.00

6 transistor, as above \$2.00

LAFAYETTE HA-600A SOLID STATE**GENERAL COVERAGE**

- 5 BANDS 150-3000 kHz, 550-1800 kHz (Broadcast band), 1.8-4.8 MHz, 14-18 MHz, 10.5-30 MHz
- Operates from 12 Volts DC (negative ground) or 220-240 Volts 50 Hz.
- e Field Effect Transistors in RF Mixer and Oscillator Stages.
- Two Mechanical Filters for exceptional selectivity.
- Voltage Regulated with Zener Diodes.
- Product Detector for SSB/CW.
- Edge Illuminated Slide Rule Scale Dial with "S" Meter.
- Calibrated 100-1000 KHz, 10-1000 MHz Bandspread Calibrated 80-100MHz Amateur Bands.
- Variable BFO, Automatic Noise Limiter.
- Speaker Impedance: 4 to 16 ohms.



Price \$215.00

P & P \$2.00

Also available — HA-800D Amateur Band, 6 Bands 3.5MHz to 29.7MHz and 50-54MHz as above features with 100kHz calibration facility: \$210.00. 1800kHz Xtal Extra \$16.78.

P & P \$2.00

SOLID STATE WIDEBAND RF SIGNAL GENERATOR**GENERAL FEATURES**

This is an all solid state, wide-band RF Signal Generator which produces low impedance low distortion RF signals. It is highly dependable, an extremely accurate and is a handy working instrument for service benches and electronic equipment production centres.

SPECIAL FEATURES

- Generates wide range signals from 100kHz to 10MHz in six frequency ranges.
- All solid state construction for instant waveforms, compact and lightweight portability.
- Includes 400Hz signal source for modulation of output signal, which can be modulated by external sources.

Price \$99.50. p & p \$2.00

Disposal Specials — Richmond only

SBPI CRO tubes, new \$3.00

Headphones, low impedance, ex-Army
In sealed box, pair \$2.00

Tag strips, 7 lug plus 2 mounting lugs

10 for 50c

Egg insulators, porcelain, new, ea. 12c
20 amp DC meter in wooden carrying case \$10.00

Telephone hand set with PTT switch, ex-Army \$1.50

Coil formers, 1 1/4" with octal plug, 40 cents each or 3 for \$1.00

No. 19 and 62 transceivers, partly wrecked, any reasonable offer accepted.

Personal shoppers only.

**TRIO 3" OSCILLISCOPE DC — 1.5 MHZ
MODEL CO-1303A****SPECIAL FEATURES**

- Vertical sensitivity of 20 mv/div, with step attenuator, AC/DC operation & wideband frequency response from DC to 1.5MHz.
- DC vertical and horizontal amplifiers for wide versatility make possible normal sweep speeds of less than 1Hz.
- All solid state construction for compact, reliable portability.
- Smooth filter glass CRT face and exclusive designed graticule, graduated in dB for clear waveform comparisons.
- Direct input to 150MHz for SSB and AM transmission monitoring.

Price \$150. p & p \$2.00

DISPOSAL SPECIALS

Coax. Cable, 58 ohm Ascand 15 P1/24. Brand new $\frac{1}{2}$ outside diameter. 12c per yard. \$10 per 100 yard reel.

AWA BEAT FREQUENCY OSCILLATOR

from Zero Cycles to 13 kHz, 240 Volt AC \$35.00

PLESSEY TRANSCEIVERS

in stock at present include B47, B48, C42, C45 with power supplies and accessories also available.

Brand new valves and semiconductors

2N3055 \$1.00

OA91 15c

807 \$2.00

IT4, 6C8, IR5 75c

6BA6-5AK5-6V6G-6J6 \$1.00

2E26-QQE04-7/QQE04/10 \$3.00

6SK7-ECH35-6K8G-5763 \$3.00

6SJ7GT-12AT7 \$1.50

HAM RADIO

(Disposal Branch)

104 Highett Street, Richmond, Vic., 3121 — 42 8136

HAM

RADIO SUPPLIERS

323 ELIZABETH STREET, MELBOURNE, VIC., 3000

Phones: 67-7329, 67-4286 All Mail to be addressed to above address

Our Disposals Store at 104 HIGHETT ST., RICHMOND (Phone 42-8136) is open Mondays to Fridays, 10.30 a.m. to 5.0 p.m., and on Saturdays to midday.

amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA, FOUNDED 1910



NOVEMBER, 1974

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LICENCE FEES

Since the Government doubled licence fees for the Amateur Service in the recent Budget, strong representations have been made by the Executive through both Governmental and Opposition channels. Letters were immediately written to the Treasurer, Post-Master General, Minister for Defence and Deputy Leader of the Opposition spelling out our objections to the licence fee increase and the hardships and unwarranted imposition which this placed upon all amateurs in Australia. Replies, as at time of writing, have been received from the Post-Master General, Minister for Defence and the Deputy Leader of the Opposition.

On the Governmental side, the replies have indicated the matter has now been referred to the appropriate authorities for examination. The Deputy Leader of the Opposition, Mr. Phillip Lynch, replied that he had made urgent representations on behalf of the Institute to the appropriate Ministers and had also referred the matter to Senators Guilfoyle and Durack, both of whom have Opposition responsibility in the areas to which we referred.

It is to be hoped that these representations, together with those made by individual amateurs through their local Members will result, at the very least, in restoration of the old \$6 licence fee.

The importance of individual amateurs raising this subject with their own Member cannot be stressed too strongly.

Only by each and every amateur raising his or her voice in protest can we hope to impress upon the Government the full significance of this increased cost.

It would be a great shame if even one amateur were forced, through these economic considerations, to abandon a hobby which provides, on the one hand, great enjoyment and a contribution to international understanding and, on the other hand, the potential for providing valuable emergency communications, the need for which can never be forecast.

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DIVISIONAL BROADCASTS

Do you have the time and want to keep in touch with events? If so here are the latest details available of Divisional broadcasts.

VK1WI
Sundays 10.00 Z—
3585 kHz
27125 kHz AM
146.5 MHz FM
BC Committee VK1VP, IMP, 2VB/1.

VK3AWI
11.00 local time Sundays:
3585 kHz AM
7146 kHz SSB
52.525 MHz FM
53.885 MHz AM
745.13 MHz AM

Hunder Branch Mondays 19.00n 80m.

VK3WII
10.30 local time Sundays:

1705 kHz AM
3607 kHz SSB
7146 kHz SSB
144.6 MHz AM
C1H FM

(Subject to availability at present of relay stations whilst under re-location).

VK4WI

09.00 local time Sundays:
3580 kHz AM
7148 kHz SSB
14342 kHz SSB

re-broadcast on Ch 8 FM. BC officer VK4HB.

VK5SWI

23.30Z Sunday mornings originating on 1.8 MHz band and relays as follows—

8.615 MHz by VK5ZQ
7.125 MHz by VK5NB
14.170 MHz by VK5TY
52.2 MHz by VK5ZEG
Ch 48 by VK5WB
VK5GM in Darwin on 2m
VK5DK in Mt. Gambier on 2m

VK5WFI

09.30 local time on Sundays.

3580 kHz SSB,
7089 kHz SSB
14109 kHz SSB
82.659 MHz FM

VK6WF

09.30 local time on Sundays originated on 161. Barrow 2m repeater VK7RAA and re-broadcast in Launceston area 3672 kHz SSB, 7130 kHz AM and in Hobart area on 53.032 AM, 144.1 MHz AM, 146 MHz FM and 432.1 MHz AM.

THERE MUST BE SOMETHING HERE THAT YOU WANT FOR CHRISTMAS

Books — Here's your chance to become a real expert or take up something new as the Christmas season approaches. We have the best selection anywhere because we actively study what's available all over the world. We can therefore confidently recommend the following:

Radio Amateur Callbook (USA) gives an alphabetical directory listing of names and addresses for every radio amateur in the States, Possessions and personnel overseas. Over 283,000 K and W calls are listed. New edition just published has over 800 pages. (P&P \$1.00) \$3.85

Foreign Radio Amateur Callbook (DX Listings) covers over 211,000 radio amateurs outside the USA. Companion volume to above. Latest edition runs to over 400 pages. (P&P \$1.00) \$3.85

Get the two volumes for just \$16.00 (P&P \$1.00), saving you over \$4 on combined purchase.

Radio Amateur Prefix Map of the World. Specially designed for the shack and must be the centrepiece. Printed in 4 colours. Shows 40 DX zones, plus continental boundaries, time zones, alphabetical listing of prefixes and continents. Old and DX zones included. (P&P 50 cents) \$1.50

Radio Amateurs World Atlas. The only one of its kind. Contains 11 maps including all continents (Antarctica etc.). Uses Lambeth Azimuthal equal area projection. Each map shows continental and zone boundaries plus country prefixes. Ideal for field trips and DXers. 4 colours, 20 pages 9 in. by 12 in. approx. (P&P 50 cents) \$3.00

Radio Amateurs DX Guide. A wealth of information — International DX log, World Map with prefixes, Time tables, etc. 64 pages. (P&P 50 cents) \$3.00

A Course in Radio Fundamentals — ARRL — 28 chapters for home study. Starts from basic theory, goes right through to feedback, etc. \$3.75

The ARRL Antenna Book — An accumulation of years of amateur experience. 8 Chapters of theory plus chapters on various designs. \$4.25

Hints and Kinks — ARRL — If you've got a small amount of money and a good junk box, then away you go! Hundreds of clever ideas. \$2.80

The Radio Amateur's Operating Manual — ARRL — Written for those who require the finest techniques. Covers all areas. \$3.00

Fins and Reversers for the Radio Amateur — ARRL — A good guide written by amateur experts. Wealth of information plus special jargon section. \$4.75

SSB for the Radio Amateur — ARRL — A digest of articles from QST tells all about Theory and Practice. \$4.25

The Radio Amateur's VHF Manual — A thorough treatment including history, Principles, circuits, test gear, etc., with a practical emphasis. \$4.25

Learning the Radiotelegraph Code — ARRL — Uses the "Sound" conception method which greatly simplifies code learning. \$1.00

NEW! The Radio Amateur's Handbook — Latest edition of this widely used book, 25 chapters. Textbook, Data book, Construction Manual. The reference book. \$8.00

The World Radio and TV Handbook — The complete directory. 400+ pages giving complete and exact info. on every, yes, EVER transmitted station in the world. SWLs were queuing up for this one when they first arrived. Useful DXers reference book and many sold to professional radio people. (P&P 75 cents) \$8.75

XYLs/Girlfriends/Wives/Lovers — We know how difficult it is to compete with his hobby, but we haven't neglected you. If the following few books don't appeal to you, they will to him!

US Radio Amateur Callbook and **Foreign Radio Callbook** are listed elsewhere. You can use them to do his OSLS and you'll have something like half a million names and addresses. Failing that you could correspond with their XYLs?

Radio Amateur's Prefix Map, also listed earlier, makes a good excuse to venture into the shack or even get him to tidy up. It's colourful, 28 in. by 40 in. and only \$1.50. At least you'll be able to know where the callsigns come from.



One final word, don't tell the OM you read this column, it may upset him.

POWER SUPPLY

suitable for use with 27 MHz transceivers and IC22. Fully regulated 12V @ 3A from 240V main

\$32.00



Kenwood TS-520 — 160W, SSB transceiver covers 80 to 10 metres. Features noise blanker, VOX, DX switch, 8 pole crystal filter etc. etc. Has fully transistorised receiver with 0.5mV sensitivity on 80 to 15M. Stability is 100Hz on 30 minutes after warm up. Has one IC, 18FETs, 44 transistors, 84 diodes and a 3 tube line up. Heavy duty cast construction protects components and ensures lasting stability. Operates on 13.8V dc or 240V ac for mobile and field operation. Too many features to list. Call in to Gore Hill and see one. You'll want one at \$543.00 (Road Freight extra).

VHF EQUIPMENT

IC22 144-148 MHz. FM transceiver has power outputs of 1W and 10W. The 22 channels all have separate trimmers. Deviation 5-15 MHz. Features solid state Tx/Rx relay, large built-in speaker, MOSFET front end with 5 helical filters, noise cancelling mic., quick disconnect mobile mount. And if the spec doesn't grab you, the looks will. Soft green back lighting, special incoming light and even a light to tell you of incoming signals if the volume is turned down. Supplied complete with workshop manual and accessories right down to a silicone cloth to keep the set like new. Fitted with one set of crystals for 146.00 or 146.5 MHz (please specify). Normal price is \$245 but we are introducing them at only \$189.00, freight anywhere for only \$3.50 including insurance).



Kits — Knock one of these popular kits up over your holidays. 30 Watt VHF Amplifier intended for 2 Metres but easily adapted to 6M. Only 300mW gives a full 30W out from a 12.6V supply. Ideal for mobiles. Uses the ultra-robust 2n5589/90/91 (2n6559 stage not needed for 6M)

7 Watt stage 2n5589 \$12.50 complete
15 Watt stage 2n5590 \$14.50 complete
30 Watt stage 2n5591 \$18.50 complete

All three stages together for only \$38.50. If building 6M version please request instructions.

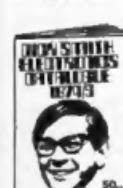
200MHz Counter Kit (E.A. Dec. 73) fully solid state with 4½ decade readout via 7 segment LED displays. Leading zero suppression. Internal crystal timebase or external calibration as required. Inputs from 50mV to 10V rms into 1CM across 50pF. Definitely the best value possible. Basic 200MHz counter \$10.00 or with precaler for full 200MHz \$15.00 (P&P \$2.00).

Digital voltmeter (E.A. Oct. 73) uses the Analog Devices 3½ digit panelmeter with an accuracy of 0.05% plus or minus 1 digit. Covers 200mV to 2kV and 20 ohm to 200k. Complete kit \$146.00 (P&P \$2.00).

Note: Both the instruments are supplied with push buttons and front panels so that their appearance lives up to their performance.



RF Probe. \$9.50. Temperature Probe, was \$11.00 now \$8.50. 30KV probe, was \$11.00, now \$8.00. HURRY, HURRY!



Catalogue — Dick's new catalogue was published in October's Electronics Today. If you haven't got a copy send 30 cents towards P&P. Catalogue is the usual small print 64 pages. To print it like the other would require around 1000 pages, which we couldn't afford, so get a magnifying glass. Three papers for Amateurs alone plus all the useful bumph you can never find. 50 cent vouchers, Mail Order form etc., etc. Send now

Dick Smith Electronics
160-162 Pacific Highway
Gore Hill, 2065 439 5311

Atas 124 Home Highway, Bankstown (100yds from Chapel Road)

Dick please send me a copy of your new 64-page catalogue. I enclose 30c towards post and packing.

Name _____

Address _____

Postcode _____

QSP**WARNING!****RAPID PRINTED CIRCUIT BOARD ETCHING**

In recent weeks items have appeared in electronics magazines suggesting the use of a mixture of Hydrogen Peroxide and Hydrochloric acid as a rapid etchant for printed circuit boards. Both chemicals are dangerous in themselves but when mixed and a copper board added an exothermic (heat generating) reaction is started which can go into thermal runaway — with explosive results. The results of flying glass and boiling acid on the surroundings (i.e. you) are too horrifying to contemplate.

Even given that the mixture might not explode, chlorine gas may be given off and the results of inhalation of even a small amount are nasty and lasting. (Chlorine was used during W.W.I as a poison gas).

The amateur would be well advised to stick with Ferric Chloride solution as it is safe (provided you don't splash it in your eyes or try to drink it) and stable. At room temperature with fresh solution a board should etch in about half an hour and if the solution is warmed etch times as short as 5-10 minutes can be achieved. Do not bolt though, as nothing is gained and it tends to split.

R. Roper

ALLOCATION OF FREQUENCIES

One of the potentially controversial claims made by the 'Third World' (less developed) countries, supported by China, at the WARC (Maritime) in Geneva a few months ago relates to the joint ownership of the radio frequency spectrum by all countries. It appears that these countries actively dispute the historical development of the international allocation system which gives first users the right of protection against newcomers. How far this philosophy will spill-over into allocations not directly related to the original service is not known, but it could be problematic with any degree of precision but if it does the amateur bands might present a tempting target. Certainly the 7 MHz amateur band might well be claimed to belong to those broadcasting stations which have populated it for so long by the time WARC 1979 approaches.

UHF TV

The ABCB has announced channeling arrangements for UHF television as a first step towards the future introduction of some TV services on UHF. The UHF channels extend from Channel 26 (526-543 MHz) to Channel 34 (574-582 MHz) in Band IV and from Channel 39 (614-622 MHz) to Channel 63 (806-814 MHz) in Band V and are slated to supplement the existing 13 VHF channels. The non-contiguous numbering system arises from the desirability of arranging for uniformity between Australian channels/frequency allocation and present overseas practice. It is noted that no UHF transmissions have as yet been authorised but the need to do so for new types of TV services might arise in possibly 5 years time. In the shorter term, however, the Board would be authorising UHF transmissions to supplement VHF transmissions for "fill-in" type services. No new services, it is said, will use Channel 5 in the future in accordance with the FM Inquiry recommendations and many existing services on this channel will have to change to an alternative channel to make way for the introduction of FM broadcasting.

CALL-SIGN PREPARES

The following call-sign blocks have been allocated: A9A-A9Z Bahrain; C4A-C4Z Republic of Cyprus; H3A-H3Z Republic of Panama. The Republic of Gambia has become the 147th member country of the ITU. XVSAA, XV5AB and XBSAC have been authorised exchange radiocommunications with other amateur radio stations outside the Republic of Viet-Nam. Radio Comms. Aug. '74.

RECEIVERS

Pat Hawker G3VA in TT (Rad. Comms. Aug. '74) discusses some of the valid reasons in favour of home-brew HF communications receivers quite apart from any natural sense of achievement that comes from such a project. 'Just as teenagers can build a performance car that will outperform Detroit's creations on the drag strip, many an amateur can build a better receiver than one he can afford to buy. Yet too many of the designs in amateur journals are imitations of commercial designs and although giving their builders valuable experience too often result in an inferior receiver at a higher cost'.

**BOOKS OF INTEREST FOR AMATEUR OPERATORS**

Electric Guitar Amplifier Handbook — W. C. Cook	\$7.65
Transistor-TV Servicing Guide — Robert G. Middleton	\$4.70
Transistor Substitution Handbook No. 14 — Sams	\$3.25
TV Servicing Guide — Arranged by Trouble Symptoms — Leslie D. Deane & Calvin C. Young, Jr.	\$4.00
Electronic Organ Servicing Guide — Robert G. Middleton	\$5.45
Radio Handbook, 19th Edition — William I. Orr	\$14.95
Colour Television Theory — Huston	\$11.70
Single Sideband for the Radio Amateur — A.R.R.L.	\$4.85
PAL Colour Television for Servicemen — W. C. Cook	\$15.00
VHF Handbook for Radio Amateurs — Herbert S. Brier & William I. Orr	\$6.60
99 Ways To Use Your Oscilloscope — Albert C. W. Saunders	\$4.95
Transistor Audio Amplifiers — Jack Darr	\$6.05

ADD POSTAGES: LOCAL 45c

INTERSTATE 75c

McGILL'S AUTHORISED NEWSAGENCY

Established 1860

"The G.P.O. is opposite"

187-193 ELIZABETH STREET, MELBOURNE, VIC., 3000

Phones 60-1475-6-7

A Sheet Metal Bender

Reprinted from Zero Beat, December 1969

Simple construction and usefulness are combined in this easy to make machine which will bend the softer metals up to 18 gauge and the harder metals up to 24 gauge.

The length of the machine must be determined by the constructor having in mind the largest chassis likely to be required, so plan the size accordingly. The nominal measurements are for 24 inches long overall, giving a bending length of approximately 20 inches.

THE FOUNDATION

The wooden foundation pieces are 1½ inch thick and should be of well seasoned hardwood; the base is 5 inches wide, the hold down 3 inches and the bender 2½ inches wide. Note that the inside edge of the hold down is bevelled to a slope of approximately 30 degrees (the metal edge too) to allow for the natural spring back exerted by metal when bent in length. If the bender is brought tight against the bevel, the metal when relieved of pressure, will spring back to a right angle. The wooden surfaces that come into contact with the metal to be bent are covered with iron, or mild steel, either fully or by 2 inches x ¼ inch flat, fixed with counter sunk screws set slightly below the surface. If the strip is used rather than the full plate, then build up the surface flush with the metal by using ½ inch masonite fixed with glue, nails or counter sunk screws.

The hinges must be robust and free from wobble, so obtain a good pair. A slight clearance must be made in the wood to accommodate the knuckle of the hinge. The hinges may well be fitted before the wooden surfaces are covered, as the two edges must bind as closely as possible to ensure a clean bend. This part is probably the most important so exercise care and accuracy in fitting.

THE HOLD DOWN

This rides freely on two ¼ inch bolts which are a fixture in the base. Hexagon heads, let in, are ideal. The centres are set about 2 inches in from the front edge and from the side. A steel washer under each wing nut will make tightening easier. Slots are required in the hold down for

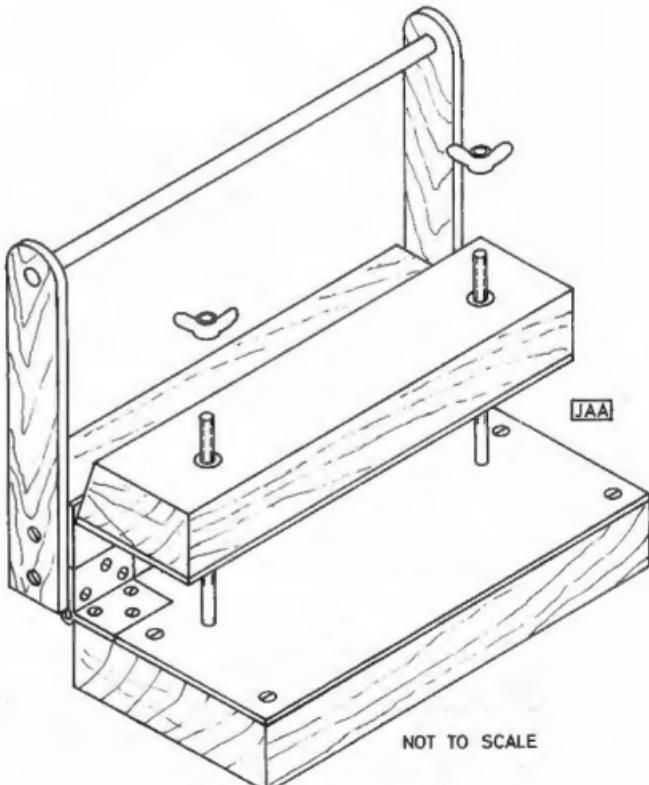
box forming and should be approximately 1½ inch deep. The distances apart are determined by chassis size required and can be put in as required.

Two blades in a hacksaw frame (teeth of each blade opposite to each other) will give sufficient width. The slots are cut into the bevelled edge.

Alternative to cutting slots, a narrow piece of ½ inch mild steel could be used, the slots being cut into the wood with

a wood saw then the metal cut to length, ends squared and fastened, with a gap, to correspond with the slots in the wood. (Or a number of different length hold downs could be constructed.)

The bender is lowered to a horizontal position and the work allowed to project over the edge of the base as is desired. The material is then clamped with the hold down and the bender pulled up to a vertical position. *



SSTV Scene - 1974

Since earlier articles in AR were published, the popularity of SSTV in Australia has been little short of fantastic. The amount of video coming from Australian shacks is on the increase daily. There are, at this time, more than sixty stations with monitors.

To help those interested in venturing into this field, it was thought wise to let all know of the present state of the art in Australia and overseas.

Import duties make the procurement of commercial equipment quite out of the question for most amateurs. Hence most SSTV equipment used in Australia is of the "home brew" variety.

The need to provide help to would-be Slow Scanners was realised by the Eastern and Mountain District Radio Club (EMDRC) SSTV group, and thus the ground was prepared to provide "State of the Art" printed circuit boards and designs around available commonly procurable local components. To date, the group can supply at cost, printed circuit boards for X51 monitor, X52 camera, SSTV master sync pulse generator, Fast Scan to Slow Scan Sampler, and Video Keyboard.

All of these boards will be supplied with circuits and component details. It is emphasized that these boards are the result of a tremendous amount of research culminating in a finished product which, with

little effort, is right up to the state of the Art.

MONITORS

The earlier monitors derived their sync and raster from the distant station and thus when sync was not forthcoming the screen remained blank. It was not long before monitors began to appear whose locally generated ramp generators were synchronized to the incoming video.

This gave the added benefit of a continuously painted raster and even when a slight loss of sync did occur, video information would still be presented in a very recognisable form, and in some cases one would not realise that any disturbance had occurred. Sync derivation techniques improved to allow for better signal to interference ratio. The earlier development of toroidal tuned circuits to extract the 1200 Hz sync pulse has given way to the physically compact use of active filters using operational amplifiers. Some circuits go even further and use phased locked loops. However, this idea has not received as much attention as it deserves.

The X51 monitor board will provide the constructor with the major back-bone for a monitor. It is fully solid state using Operational Amplifiers extensively and commonly available components. The only additional components required to complete the monitor are a CRO tube, EHT supply and basic power supply (+ and -15 volt regulators are already on the board).

The original use of P7 phosphor tubes (5BP7, 5FP7, 7BP7 etc.) was alright, how-

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ever, the availability of these tubes now is a problem. Also, deflection and focusing coils were an additional problem as these are likewise very hard to obtain.

The SSTV group realising this problem, approached a TV tube re-gun manufacturer for an alternative. The outcome was a major breakthrough for the Australian SSTV exponent. After much testing, an E26 phosphor was developed which could be inserted in any TV glass ware. The finished product is a brand new guaranteed tube with a phosphor which could be viewed in relatively bright lighting (Twin 40W fluorescents) something which was only a dream with the P7 phosphor.

At present we are awaiting further tests on several new phosphors imported from the UK. These have very interesting possibilities and hopefully we may be able to further improve the E26 phosphor, which has a very slight tendency to smear and cause slight loss in picture definition compared with the P7 style of phosphor.

Additionally the bright trace was eliminated from the picture during scan. The picture colour is a reddish orange, but after viewing for a short time one quickly adapts to this colour against the green nature of the P7 phosphor. An 11 inch tube can be supplied "off the shelf" for approximately \$26.50 plus packing. Eight inch tubes are now a little hard to come by, due to glassware problems. This is most likely caused by TV stations standardising on larger video monitors. However, if you can obtain a tube of smaller dimensions with an intact envelope, EMDRC will re-phosphor and re-gun this for you. The most common size of picture raster depends upon the viewing distance, but normally a 6 inch square picture is satisfactory, and going above this size will tend to cause degradation in the picture due to the line spacing.

By using the TV picture tubes, standard focusing, deflection and EHT component parts are used. The normal EHT requirement for this phosphor is about 13.6 KV. This is a compromise between brightness and persistence. A word of warning: the screen will burn instantly if a spot or a high intensity picture is left on the screen for any length of time. However, the X51 monitor has "spot kill" and line deflection failure circuits inbuilt for tube protection.

After one has completed his monitor and has overcome his excitement of receiving high quality pictures from all over the world, he quickly wants to get amongst it and send his own video. Probably he has approached one of the SSTV operators and has his CQ call, name and QTH on tape to attract attention, but it's not the same as sending what he wishes when he wishes. Now he faces the decision of how



Doug VK8KK with home-built slow scan monitor at lower left, fast scan monitor above, Akai tape recorder, and FTDX400 transceiver.

to tackle the problem. He has the basic choice of three directions:

1. Flying Spot Scanner.
2. X52 type of Camera.
3. Fast to Slow Scan conversion technique.

Taking them one by one.

The Flying Spot Scanner can be broken down into two types. "See through" and "Reflective". The "See through" type places the scanned subject between the raster tube and the photo multiplier and is naturally a transparency. The reflective version places the image to be scanned in front of the raster which is focused upon the image. The reflected light intensity is picked up by two photo multipliers placed in front of the lens.

Out of the two, the reflective system is by far the most flexible, enabling the average amateur to find transmission data from books, etc. or his own pen drawings of the appropriate size.

The other method requires the amateur to dabble in photography and thus limits his capabilities. Both systems give the same picture quality. The electronics behind a Flying Spot Scanner are very simple and basic. They would also be by far the most inexpensive. The metal work, etc. in the construction requires a bit of a workshop and poses the biggest headache.

When building a Flying Spot Scanner, several operators have run into smearing definition problems. This has been due to the phosphor of the raster tube. 3BP7, 3FP7 and the like as generally used for this purpose rely on the fast phosphor (the bright blue trace—not the green afterglow) which allows for a fast rise and fall time used in scanning. However, during their time of manufacture (WW2) the prime objective was to produce the "P7" phosphor i.e. the long persistence, and the "excitation phosphor" was not always of a fast writing type. The author has had experience of having three 3BP7s by the same manufacturer produced within a four month period giving completely different results. Only one tube was satisfactory. If you have a smearing or similar problem, this could be your trouble.

Incidentally, while talking CRO tubes, we in VK are trying to convince overseas manufacturers to change the 1:1 picture format, for the standard 4:3. Even the foremost manufacturer of SSTV equipment uses a 4:3 tube but masks out the remainder of the unused tube. Of course, as previously mentioned, the large majority of VK monitors use TV tubes, and technically there are only advantages to be gained. The only draw-back being those old CRO tubes which give a smaller overall picture. It will not be long before these surplus P7 tubes will become extinct.

Some amateurs would be quite happy to stop at a Fast Scan Sampler and put up with its draw-back of having to prepare all material which is to be sent beforehand. However, the bug normally bites to own a camera and shoot scenes at random.

Improvement always means added expenditure and increased technical finesse!



Example of digital video — produced from home-built keyboard of UK8KK.

Thus we move onto cameras.

X52. This is similar to the commercial SSTV cameras and it derives all its voltage requirements from its matching monitor. It is technically a "fast scan" camera with built-in sampling. One should not confuse the term fast scan as related to normal TV transmissions, as the term indicates. However, it runs at a 4 kHz rate, which is then sampled. It can be seen from this that a "fast scan" output is not compatible with normal TV monitors, and thus cannot be displayed on same. Most commercial SSTV systems employ this technique though lately a new brand has come out with the true fast scan sampled camera. The only draw-back with the former system (4 kHz sampled) is that all set up focusing, lighting etc. must be carried out observing your slow scan monitor. This can be frustrating and time consuming, waiting for adjustments to be seen on each subsequent 8 second frame.

However, all is not as dark as might appear. With additional circuitry your CRO (if you own one — almost essential for SSTV) can be used to display the 5 kHz picture. It is quite acceptable and allows for instant focusing and set up.

Most SSTV manufacturers advertise a "fast scan" adaptor and in nearly all this is what they refer to.

THE TRUE FAST SCAN SAMPLED TECHNIQUE

Here again the amateur is faced with the most important immediate criterion — cost. What is required is a normal fast scan camera as used in a store security set up. It is possible to obtain one of these if one keeps his ear to the ground and is in the right place at the right time. You could be lucky to obtain one with its own monitor or else an old standard TV receiver will suffice. It is not necessary to have an RF output but one has to bring out the video. Incidentally, having procured a fast scan camera, it opens up the possibility of using this for fast scan transmissions on UHF.

The techniques here have been made very simple, and a fast scan to slow scan converter PC board of latest design is available, with a master sync pulse generator board, from the SSTV group.

By using this technique you can im-

stantly switch from FS to SS without defacing your FS camera (you may wish to sell it later) and at all times watch your picture for alignment. In the slow scan mode your fast scan display will tend to flicker slightly (due to the 16 2/3rd Hz frame rate) but is perfectly readable with very little degradation.

Before leaving video generation techniques, a word about SSTV FM modulators. Some of the older circuit's use discreet component multivibrators. These are extremely hard to set up and to hold their settings. The latest thing is the NE556 which is a voltage controlled oscillator and the implementation of one of these plus an Operational Amplifier low pass filter will provide a very stable modulator.

OVERSEAS TRENDS

Most stations you exchange video with outside Australia will be using commercial equipment; however there still remains a hard core body who "roll their own" and exercise new techniques. You will quickly recognise these operators because in general, their video will stand out over the normal run-of-the-mill video.

The latest to come from the USA, namely from WOLMD, is direct conversion from fast scan to slow scan without any modification whatsoever to the camera. This complicated process will digitally convert any fast scan video to slow scan which opens up great possibilities.

Further to this, a slow scan to fast scan system is now working as designed by this same person. This is undoubtedly the slow scanner's dream. To do away with all long persistence phosphor tubes. You would then be able to view all received video on your common fast scan receiver. This process is not easy and requires a very large capacity memory which is loaded at slow scan rate and continuously read at fast scan rate. A project of this nature is almost impracticable for the Australian amateur due to the cost of the IC's needed. However, as the IC continues to fall in price, the practical feasibility draws nearer. Maybe by that time some enterprising person will have designed the complex PC boards.

Obviously the next possibility as a flow on is instant colour slow scan pictures. Technically, with what is available at this very time, it is quite feasible but the catch is how to do it without spending a million dollars.

Another interesting adjunct to the SSTV field is the SSTV video keyboard. As any slow scanner soon finds when trying to have a QSO, or especially in a contest, he ends up with large amounts of paper with call signs, reports, and the like he has been flashing before his camera.

This little magic box eliminates all this. It consists of a keyboard (like a typewriter) in which ASC II characters are generated and eventually converted to SSTV. Hence, you sit back and type away your QSO and video mix with your camera. No fuss, no bother, the hardest thing is the typing. This magic box with its 60 odd ICs will be available from the SSTV group as a PC board by the time you read this.

There is already a great queue of overseas amateurs awaiting its release.

COSTS

The first thing most amateurs ask is "how much will it cost me to get into SSTV?" The second statement is "Oh, it's too difficult for me".

Well, the difficulty angle as previously explained has been overcome by the production of first-class fibre glass solder dipped and gold flashed edge connector PCB boards and it is simplicity plus to insert the components.

It is always difficult to put a price tag on a home-built piece of equipment for each amateur has his own degree of junk box. The basic components are hereby listed as a guide, but it must be remembered that nowadays prices change by the hour.

PC board for monitor (X51) \$11.00

PC board for camera (X52) \$11.00

11 inch E26 tube \$26.50 + \$1.00 P & P

SSTV sampler \$6.50

SSTV sync pulse generator \$6.50

K7OLO fast to slow scan boards

(2 in set) \$20.00 pair

Resistors capacitors IC for monitor — supplied on request

Resistors capacitors IC for camera — supplied on request

Monitor and camera kits etc. available on request.

Finally, to answer some of the more general questions that are asked besides availability of circuits and costs which have been covered earlier.

Q. Where can I obtain information on SSTV?

A. SSTV handbook published by 73 available from advertisers in AR or SSTV Group.

Q. Where do you find SSTV operators?

A. Mostly on 14 MHz (14230 kHz) which is the most active frequency for all slow scan, but there is activity also on 3565, 7126, 21340 and 28650 kHz when conditions permit.

Q. How can I record SSTV pictures?

A. As SSTV signals are FM audio tones ranging from 1200 Hz (Sync) to 2300 Hz (white) they can be recorded on a good quality tape recorder. In attempting to record signals blind, (without a monitor working) off air, your results will be doomed to failure. This is due to the cor-

rect tuning necessary (in fact it is not that critical) and without a working monitor it is difficult to achieve. SSTV dubbings of tapes for alignment purposes are available to you by sending your tape to the SSTV group. Remember direct electrical patching between recorder and receiver audio is a must, otherwise severe sync pulse distortion will result.

Finally, on tape recorders. Wow and flutter are the major problems and even with the more expensive cassette types this proves objectionable. Straight lines etc. tend to jitter. Reel to reel recorders to 3 1/4" or preferably 7 1/2" per second are most satisfactory. However, if you will accept the jitter, use cassettes. Watch out for RFI into your recorder. A lot of cassette recorders with ICs suffer badly in this regard.

Q. How do I receive information on SSTV?

A. Join in with the SSTV gang on 14230 kHz and someone will always be willing to slide off the frequency and give you the latest "drum". Everybody is most welcome, but rag-chewing without video on the International SSTV net frequencies should be avoided. SSTV operators in general are poor letter writers and it is quicker to get you acquainted with what concerns you over the air.

Q. I cannot handle anything with these IC things in them.

A. A complete untruth! They are simple to fault and anyway, if you get into trouble, there are plenty of people to help you on 14230. Besides, if you follow the drawings and put the right things in the right place, you should have immediate success. The next SSTV operator has built the same monitor as yours.

Q. What test equipment is necessary?

A. (a) Ideally most SSTV stations should be equipped with a DC CRO that will reach to 5 MHz.

(b) Alignment of modulators require precise frequency adjustments which indicates a digital frequency meter; however, tone tapes are available for this purpose.

(c) Normal multimeter etc.

Q. What modifications to my transmitter are necessary to transmit SSTV?

A. Nil — by using, if you have it, the "phone patch" facilities (e.g. FTDX 400 etc.) the 600 ohms input/output can be fed to and from your SSTV monitor or modulator. Remember SSTV is FM audio and the ratings for PA are continuous duty cycle. Reduce your input accordingly or a PA tube "wipe out" will occur within no time at all. Watch for colour in PA tubes and reduce input below this point when transmitter is correctly tuned.

Typical Symptoms of picture degradation:
Multipath distortion. Picture displaced due to loss of sync or multiple sync. At times picture unreadable even though signals are very strong. Fault is due to propagation causing sync to arrive at different time intervals. Nothing can be done to overcome this trouble. The higher the frequency the less the multi-path effect. Long path signals are less affected than short path

of similar or even weaker signal strengths. Picture too dark — receiver tuned too low in frequency. Often loss of sync will occur at the same time.

Picture too light, lacking in contrast — Receiver tuned too high in frequency. Loss of sync not always noticeable and in general vertical sync disappears before horizontal sync.

Show on picture when signals are strong and sync is good — Too high a level feeding monitor.

One of the most common complaints confronting the SSTV scene revolves around received pictures having too much contrast or too little. In 90 per cent of these cases, the fault lies at the transmission end. It is an easy trap to set up the camera and monitor to give the indications of a perfectly balanced contrast range, however, this need not be so. Thus a "shack standard" must be maintained to overcome this problem. Commercial monitors normally supply a test tape for adjustment purposes. On this tape a grey scale is presented and the monitor should be set up to this standard, controls marked for reference and settings used as such to set up your camera. For those who roll their own, one can procure a test tape as mentioned earlier, or have someone send you grey scale over the air for calibration purposes. Ideally, one should construct a grey scale generator for this purpose. The X51 and E26 monitor combination can easily display six distinct levels of grey scale.

Hopefully, now your interest has been aroused in SSTV, for you can see the way has been paved in VK to help you join in this rewarding aspect of our hobby by allowing you to follow in the footsteps of others who have learned the hard way.

Join in the fun, we hope to see you on the nets.

ACTIVE SSTV OPERATORS IN VK, ZL AREAS

VK1AU	Col	VK4NP	Norm
VK2KK	Ted	VK4NNO	Tom
VK2KL	Gill	VK4PZG	Barry
VK2MGO	George	VK4PSV	Peter
VK2SMO	Mike	VK4SAV	John
VK3CR	Rod	VK4SCY	
VK3LM	Stan	VK4SMF	Al
VK3LM	John	VK4SWG	Chris
VK3MK	Rees	VK4ZPQ	Peter
VK3WX	Billy	VK4ZQS	Col
VK4PAB	Jack	VKTJW	John
VK4SEG	Ted	VKT7B	Trevor
VK4NMN	Milton	VKT7F	Mike
VK4AQH	Phil	VKT7M	Tom
VK4ABM	Walley	VK4BK	Doug
VK4AQL	Geoff	VK4KX	Tony
VK4AMC	John	V29MC	Mac
VK4BBD	Bob	P29DJ	Graham
VK4BFM	John	ZL1ADW	Malcolm
VK4BAX	Max	ZL1ADY	Ian
VK4YEO	Mac	ZL2AAV	Ralph
VK4TM	Trevor	ZL4PJ	Bronk

SLOW SCAN NET FREQUENCIES

60	3670 kHz	15	21340 kHz
40	7155 kHz	10	28650 kHz
20	14280 kHz		

For information on SSTV, Kits, PC Boards, alignment tapes, picture tubes etc., contact John Wilson, VK3LM, c/- Eastern & Mountain District Radio Club, PO Box 87, Mitcham, Victoria.



Rig of Barry VK5BS showing home-built byg

Telecommand and Telemetry of the OSCAR 6 and 7 Communications Satellites - Part 2

David Hull, VK3ZDH
Project Australia

As had been stated the Australian system of Autocommand was designed and built as a package. Non-availability of computer time on a day to day basis and the possession of certain items of hardware forced the initial design more on economic grounds than anything else.

AUTOCOMMAND — 2. The Australian System
It was decided from the start to eliminate as much as possible the use of electro-mechanical devices such as tape readers and magnetic tape recorders to ensure as much reliability and freedom from maintenance as possible. Previous experience had proved the practicability of static shift registers and character recognition as a cheap sequential memory source. Baudot code was chosen instead of the more usual ASCII simply because the author owned a Creed Model 7B

teleprinter. The initial character recognition of the 31 characters (ignoring upper and lower case) of Baudot has proved more than sufficient for Oscar 6. However, Oscar 7 will require the use of 35 command words alone so upper and lower case memory circuits will be added to the experiments.

The choice of memory length in terms of bits was taken as a result of the unique window of the two satellites (and hence Oscars 6 and 7 which were flown as secondary payloads with these satellites) over Australia. The two orbit patterns result in 2 groups of visible orbits over Eastern Australia in a 24 hour period, 3 to 4 orbits centred on 0800 hours east and a second group centred on 2200 hours east. A period of some 8 hours exists in the middle of the day when no orbits are visible. This pattern of command requirements led to the choice of 2 independently loaded shift register memories for a 24 hour period.

MINIMUM LOAD 3 ORBITS 512 BITS

TR Z Z C V V
WTR Z Z Z B R V V V C C
WTR Z Z H C V X
NNNN

Words are 2 letters (16 bits) long.

MNEMONIC LIST. Australian Auto Command

Load stop functions only	1st let	2nd let
Memory Select (# Deselects Previous Mem)	S	7
LOAD	S	8
READ	L	D
<u>LOAD or READ FUNCTIONS</u>	R	D
WAIT		
Transmitter ON	T	R
Antenna Move (NOT USED) (16 bit word)	M	
COMMAND	Z	
1	X	
2	(TRANSPONDER OFF)	
4	C	TMFRM ARE TFR
8	(455.1 mhz Beacon off)	HAIN COMMANDS
9	V	(Telemetry to 10 WPM) USED.
17	B	(AGC ENABLE)
TRANSMITTER OFF	Z	(Clock Reset)
Print (Teletypewriter)	CR	LP
Stop Printing	P	H
Stop (Rewrites to load stop)	P	S
	N	N N

Figure 6 Sample Frame of Teletype Telemetry Data

11001-10111-00000-00101-11101-01010-11111-10101-00111-11011
11001-10111-00000-00101-11101-01010-11111-10101-00111-11011
00977-01558-02873-03730-04157-05534-06368-07198-08614-09734
10854-11220-12348-13149-14000-15674-16075-17598-18664-19025
20282-21363-22532-23123-24672-25589-26131-27506-28907-29211
50871-31089-32140-33585-34613-35851-36722-37255-58234-39189
40645-41452-42950-43001-44335-45786-46479-47362-48919-49604
50057-51482-52942-53717-54451-55184-56999-57500-58236-59968

It was decided early to only pre-programme 24 hours in advance to allow maximum flexibility for last minute changes and as a safety measure in case of power failure, etc. It has been found in the many months of operation of this system that the author is in attendance to check approximately 80 per cent of the orbits commanded. A further benefit of the choice of 2 memories to cover 24 hours has been the ability to use a simple elapsed time clock between orbits. The "wait" period has been fixed at 100 min. and this is derived by counting 50 Hz mains cycles.

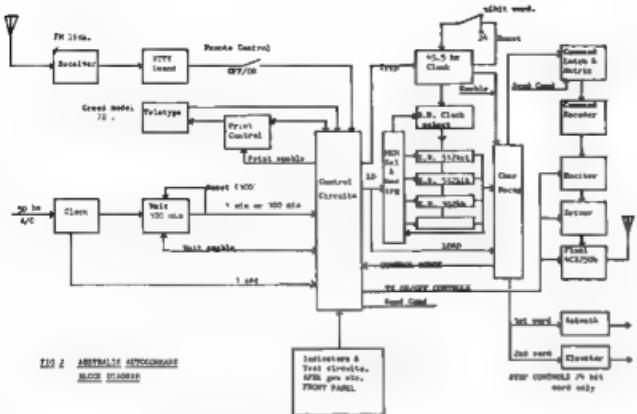
With Oscar 6's orbit period of 114.994 minutes the 100 minute wait period allows commands to be sent over at least the initial 50 per cent of the orbit pass. Letters (or symbols) from the shift registers are read in groups of 2 or 3, depending on whether antenna positioning is required, at intervals of 1 minute during the orbit. A "minute" word therefore is 16 or 24 bit length (2 bits are used as the letter step function instead of the usual one, to allow even subdivision of the 512 and 1024 bit shift registers used). A two letter "word" is used for the more critical control functions such as "Transmitter on" or "off" as a safety measure. Single letters within the 16 or 24 bit minute word are used for command selection and antenna positioning and for time wait periods.

It is intended to allow a more versatile wait period by using a programmable number of the wait clock with its programming code selected as the 2nd letter of the wait command. This will be added when time allows. As the attached mnemonic list shows certain control functions such as memory load, memory read and memory selection (4 separate shift registers of varying multiples of 512 bits are available) can only be selected when the shift register clock source is disabled (stop mode). All control functions are sent from the teletype keyboard in the stop mode. This allows positive checking of S.R. load as a teletype print out. Correct timing is assured by parity check circuits, also the S.R. are always filled to capacity. The recognition of 4 successive 'N' will disable the S.R. clock and place the system back in the load stop mode, i.e. under the command of the keyboard. Figure 1 is an example of a "minimum" load of 512 bits covering 3 orbits and the intervening wait periods.

Antenna positioning is not used in this example, i.e. an omni directional antenna is used. This is adequate for orbits 10° max. elevation or more. Directional antennas on azimuth-elevation mounts must be used on lower elevation orbits or where weather conditions (hot days) may cause bending of the command signal. When antenna positioning is not required a 24 bit (2 letter) word is selected and the appropriate antenna control switched off. When antenna positioning is required a 24 bit word is sent and the first antenna position within the 24 bit minute word frame is used to stop the azimuth and elevation units (in 10° increments) when required. Autohome circuits are used on these control units after each orbit. The azimuth unit used is a modified commercial Stollie rotor and the elevation unit was made for the author from a DC motor with worm gear drive and remote lead sensing by a friend. The last letter of the 16 or 24 bit word is used to select the command to be sent and through a latch and matrix selects the 3 bit of 7 code to be sent on the command encoder board. This command is sent in brackets of 5 at 1 second intervals at each minute period. The drive to the transmitter is removed between these bursts of commands so that a minimum of radiated signal is used.

As the block diagram shows, the block diagram shows, the final power amplifier, a 4C x 250R vacuum tube, which is in a class C protective bias situation, has plate and screen, heater, and bias voltage applied for the whole of the pass. 1 minute before the satellite is due, recognition of the word TR applies power to the heater and bias circuits of the tube and to its blower; 40 seconds after this a timer device applies plate and screen voltage for 20 seconds after which, at the next 1 minute word, the first command is sent to the RF exciter and driver, which are all solid state, are energised. Sufficient drive is used to overcome the bias. Recognition of the characters Crlf turns off power to all stages and the next word sets the bias period until the next orbit.

Positive check is maintained on the system by a series of LED indicators including a 7 segment



numeric led indicator which indicates the SR in use and a 3 figure (7 segment leds again) bit counter on the system clock. A further 3 figure counter on the wall clock is being installed.

Several peripheral circuits have been added to allow control of the teletypewriter to save paper when printout is not required. Because the system uses the Amateur standard 45.5 Hz Baudot code speed

provision has been made to allow remote control of the system and memory loading through an AFSK line on command frequency via an AFSK demodulator built into the unit. This allows precise starting of the clock and hence the whole memory system from a remote source if need be. Other subsystems allow continuous clock operation to check memory loads and provision for dump-

ing the loads into a cassette recorder via a phase coherent AFSK generator also built into the hardware.

The hardware involved is mounted on a total of 15 small plug-in boards to allow easy modification and servicing. TTL small and medium scale integration is used wherever economically feasible. The SR and some other minor items are National Semiconductor Mos. The matrix at present in use to select the 3 or 7 code is to be replaced by a PROM to eliminate the huge matrix required for 35 separate commands. The total number of IC involved is approximately 120 and all the NOIC RF hardware and power supplies are contained within a 7" depth sliding 19" rack tray.

A system of standard orbits in 5° increments of equatorial crossings is used to predict AZ and EL settings for each orbit. These are generated by a small Fortran programme which allows prediction for any part of the world by specifying the latitude and longitude co-ordinates. A further programme is supplied in each command station that predicts orbits in terms of minutes by minute corrections to AZ and EL. As will be seen by the above description the autocommand is just a contiguer and nothing else. It depends entirely on the correct programme being fed in as "software" and also on the programme being started at the correct point in time. A more long term and sophisticated alternative is at present under development around one of the new single IC 8-bit parallel processors now available. It is planned with this unit to build virtually a dedicated minicomputer so that the standard orbit programme can be stored and a long term operational programme can be implemented by automatic reference to them and a suitable time reference. It is also hoped to supply these units to the other command stations, nominated by AMBAT world wide, as a "standard" package.

(To be concluded)

The "Pasatest" Communicating Calculator

There are so many calculators and minicomputers on the market nowadays that to merit the claim that it is the ultimate in its field, the Pasatest Communicating Calculator must be — as indeed it is — a fantastic piece of electronics.

In appearance it is exactly like the average medium priced pocket calculator, but internally the Pasatest is completely different. It is, if one can coin a phrase, actually a digital handle talkie designed to enable its fortunate owner to pass any examination for which he wishes to sit.

The heart of the unit as can be seen from the block diagram, is a micro teletype transceiver with the difference that instead of a spacer printout the characters appear on the twenty digit alphanumerical display. When he receives the examination paper the owner places the calculator on it, presses a key marked FIX, and casually moves the instrument over the paper. A microvidicon scans the writing and feeds the information into the digital processor and it is then transmitted to a friend with a similar instrument in a parked car near the building. The friend writes out the answer and transmits it to the examinee who copies it down as it appears on the alphanumerical display. So that he can copy at his own pace, each group of words is displayed until the PRO. (proceed) button is pressed, when the next group appears. A further refinement is the built-in

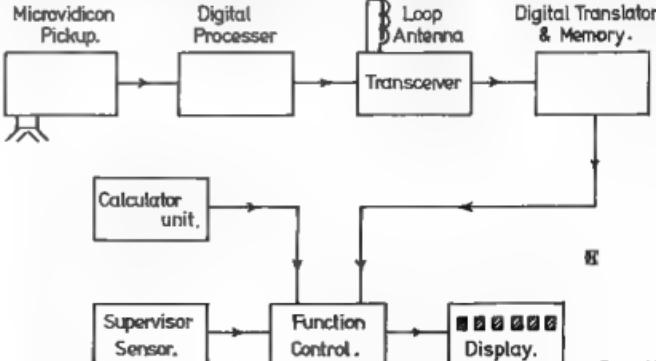
SUPERVISOR DETECTOR which, if a supervisor comes within three metres of the examinee, automatically converts the instrument into an ordinary calculator. When the danger has passed the examinee presses the PRO. (proceed) button and carries on copying down the answer. It will now be clear why the manufacturers, A. S. Windell Ltd., of Triton on the south coast of Tasmania, do not put their own name on the calculator but market a variety of models exactly resembling various internationally known makes of pocket

Roy Hartkopf, VK3AOH
34 Teatangi Road, Alphington, 3076

calculator. All models are at present in extremely short supply but if anyone wishes to send cash or postal notes to the value of \$73,000.00 (seventy three thousand dollars) to the writer as a deposit he will endeavour to procure a pair as soon as possible.

NOTE 1.—If desired the PASATEST COMMUNICATING CALCULATOR can be directly interfaced to a computer, eliminating any human error. An alternative readout in the form of an automated bistro is also under development.

PASATEST COMMUNICATING CALCULATOR. Block diagram.



The Wagga Floods – and the Amateur Radio Communications Network September 1974

Harry Hendriks, VK2ZXH
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Members of the Wagga District Radio Club recently proved that once again Amateur radio communication capability is an essential part of this country's Civil Defence, and emergency scheme.

The Murrumbidgee River proved how vicious it could be during late August and early September. Twice it rose to serious flood levels. On Thursday 29th August the mammoth task of evacuating almost the entire population of North Wagga was commenced, for it was envisaged that a severe flood would hit the city within 24 hours. The calculated height was to be in the 31 to 32 feet range. At this height North Wagga would certainly be covered with at least 3 to 4 feet of water. However, due to continued heavy discharge from Burrinjuck Dam plus continued increases in local rainfall, it was realised by the authorities early on Friday the 30th that the river would reach an all-time high of over 35 feet. (The highest reading for over 100 years). The peak was reached late Friday night at 35 feet 3 inches.

In so far as the Wagga District Radio Club was concerned, they were initially requested by Civil Defence to be on standby as a back-up for the existing SSB and 27 MHz equipment. As early as Thursday night it was obvious that the Civil Defence Systems would not be satisfactory for the "short haul" work that was to be done. Long skip on 3730 kHz, many on-frequency heterodynes, plenty of ZLAs, plus great quantities of general transient noise interference, was making the passing of even simple routine messages a very time-consuming affair. Coupled to this was the continuously increasing need for fast "evacuation-type" messages from North Wagga back to Civil Defence Headquarters on the city side of the river.

At approximately 10 p.m. on Thursday, the Wagga and District Radio Club VHF Net was officially called in to replace Civil Defence SSB on the major traffic handling nets. Continuous traffic was then passed (via WDRC VHF) between the Wardeene Post evacuation centre and Headquarters. Whilst our Amateur message handling was far removed from the official Civil Defence procedure, we would mention that at the peak of traffic important messages were being handled, without any known errors, at a rate of at least two a minute. The noise-free signals that were being exchanged between our operators via VHF over such a relatively short distance when compared with the noises and problems present with the HF SSB did

impress many influential people on the scene. When it was realised that the river was to reach in excess of 35 feet, Civil Defence ordered all personnel out of North Wagga (including our team, minus their vehicle which was abandoned).

The major scene of activity then switched to the main city side of the river. For those readers who have never visited Wagga we would mention that many miles of major levee banks surround the entire northern side of our city, with minor banks protecting the eastern and western sectors. With the prospects of at least a 35 foot river, and with the major levee bank designed many years ago to stand against a 36 foot river, a very serious situation had developed. A concentrated effort was made by every available service facility in Wagga to generally reinforce and increase in height all levee banks. As the river rose, the main duty of WDRC VHF operators was to now work with Civil Defence levee patrols and to report problems and requirements as they appeared. At one time during the Friday night there were five VHF mobiles on patrols with reports going directly to Local Headquarters of Civil Defence.

To go into details of the various situations and experiences encountered during the operation would take pages to relate. Suffice to say that the WDRC supplied continuous communication between base and out-stations from around 10 p.m. on Thursday till around 11 a.m. on the Saturday. By this time the Murrumbidgee was past its peak at Wagga and was very slowly falling. An electricity authority team took over from the WDRC on routine levee patrols and our members took a well earned rest on stand-by.

Because of the high average rainfall in our area this year, it was found that the surrounding flooded country-side was very slow in "running off", and as late as Wednesday many adjacent areas to the river were still covered by feet of still water.

On Thursday 5th September, with the river still in this swollen state, word was received that a second flood could be expected by the weekend. Expected height would be in the region of 31 feet.

Once again the WDRC was called in to provide all local Civil Defence communications. Two VHF bases were set up (Local Headquarters and North Wagga School), plus two river reading posts approximately 6 and 12 miles up stream. In addition to these "fixed" stations, levee bank patrols in North Wagga were to be covered by VHF. The whole relief operation this time was centred on the saving of North Wagga

homes from being inundated with water for the second time in just over one week. The operation was successful due to the efforts of many volunteers from all sections of the community. This second flood resulted in our operators being again on duty continuously from 9 a.m. on Friday 4th till 9 a.m. on Sunday 6th September, when the river had peaked and was slowly falling.

At the time of writing, the areas surrounding the Murrumbidgee from Gundagai to Narrandera are mostly covered with various depths of still, muddy water. We all hope that we have seen the last of floods for many years, but with an unusually high snow build-up in the catchment area waiting to thaw, plus the rather ominous looking weather maps, we are feeling a little uneasy at the moment. *

OVERSEAS PUBLICATIONS SUBSCRIPTIONS

- Inflation and new exchange rates. "Rapid inflation", says the editorial in QST for Sept. '74, "the past couple of years has had a severe impact on ARRL's budget".
- The following are the latest 1975 subscription rates which supersede all previous advices (including that on p.25 of October AR) —

\$A	1 year	2 years	3 years
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Ham Radio	6.25	10.50	15.00
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CQ*	6.50	11.00	14.50
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QST	8.50	17.00	25.50
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Break-in*	4.20	—	—
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73	7.00	—	13.50
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Mail	—	—	—
------	---	---	---

Communication	8.80	—	—
---------------	------	---	---

VHF	—	—	—
-----	---	---	---

Communications*	4.00	— Surface	—
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	6.20	— Air Mail	—
--	------	------------	---

CQ-TV	2.35	—	—
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*Present rates.

Please ask for membership form

- Write for these and details of other items to.

MAGPUBS

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- Remember these as splendid Christmas presents



KW E-ZEE MATCH, an efficient coupling unit of the Z match type for use from 80 to 10 metres over a wide impedance range. For use with balanced or coaxial feed lines at up to 1KW PEP.



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Also available Barlow-Wadley XCR-30 receiver, AM/FM digital clock radios; A comprehensive range of Hy-Gain, Newtronics, Cushcraft and Asahi antennas, SWR meters; Rotators; Morse Keys; Digital clocks, etc.; Plus, of course, the full range of Yaesu Musen transceivers, transmitters and receivers.

The items on this page are but a few from our large and still growing range of accessories. If the accessory you require is not shown on this page then call us or our agents, we're sure to have it.



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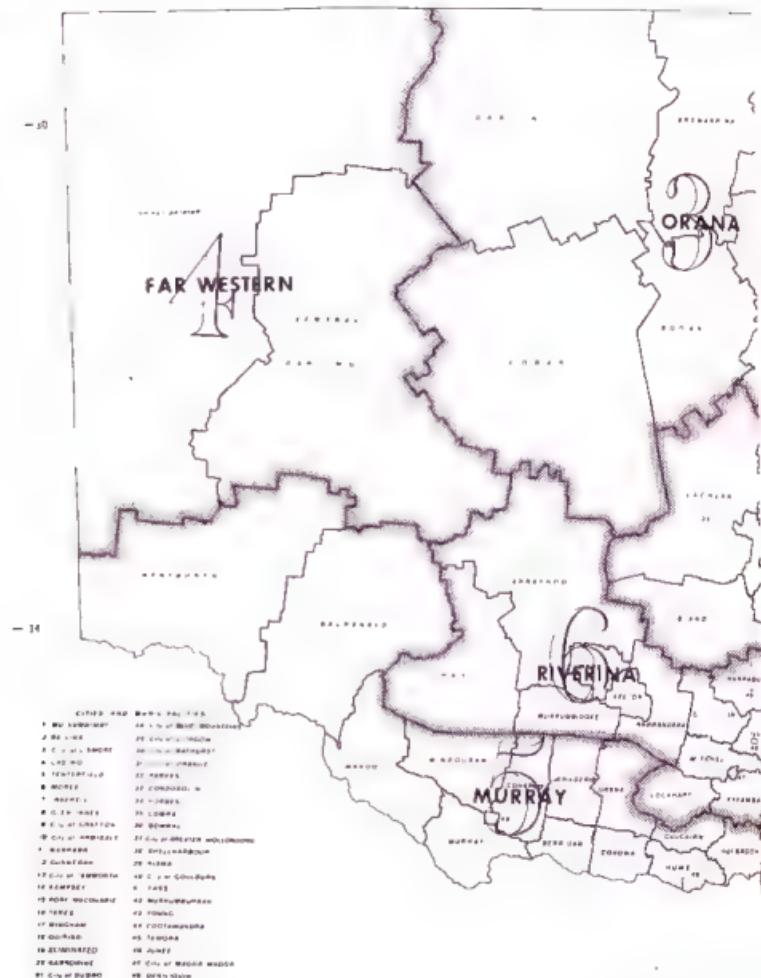
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144



REGIONS OF NEW SOUTH WALES

ADOPTED 5th July, 1871.

ABORTED 8/11/30
ONE AMENDMENT



JTH WALES

971

1723

(Continued from April, 1974)

SOUTH AUSTRALIA

VK5SD—R. S. Amos, 13 Kenwyn Drive, Campbelltown, 5074

5BF—M. H. Weed, 3 Wilson Street, Elizabeth Downs, 5113

5ZLO—L. F. Powning, 6 Oxford Street, Somerton Park, 5064

SZMC—L. W. Cheshire, 35 Creighton Avenue, Morphettville, 5162

WESTERN AUSTRALIA

VK6ZCE T. C. Baker, 69 Thoinis Avenue, Thornlie, 61122

TASMANIA

VK7AF—J. E. Nicholas, Postal Private Bag 200, Launceston, 7250, Station "Marylands", East Tamar Highway, Launceston 7250

7LW—W. B. Tahey, 38 Keeler Road, Rose Bay 7015

7OB—T. R. O'Brien, 37 New Town Road, New Town, 7008

7RW—R. M. McLean, 14 Derwent Avenue, Lindesay, 7015

7ZAX—D. L. Mitchell, 8 Weston Place, Sandy Bay, 7005

7ZMP—J. M. Powell-Davis, 30 Lanoms Street, Launceston, 7250

NORTHERN TERRITORY

VK8RR—R. Hooper, Postal PO Box 288, Darwin, 5794, Station 3 Lambell Terrace, Darwin, 5794

CHANGE OF ADDRESS

VICTORIA

VK5BA—A. E. Bromley, 44 Normandy Street, Cranbourne, 3917

3HS—G. Straker, 408 Mt Dandenong Road, Dandenong, 3125

3NW—F. K. McTeague, Change of Postal Address, 21 Ellinmore Avenue, Killara, NSW, 2071

3TG—E. L. Blackmore, 2 Willow Court, Kyabram, 3620

3AIQ—J. Glem, "Surry" Old Main Road, Ferny Creek, 3786

3AKT—M. K. Tulloch, Cnr. Dow and Bellar Aves., Typewriter, 3498

3BCT—R. D. Trickett, 22 Waratah Street, Ascot Vale, 3032

3BGN—R. W. Rogers, 18 Merritt Ave., Werribee, 3030

3ZFK—F. Swanlin, 11 Brownlow Court, Epping, 3163

3ZEH—A. C. Carnock, 20 Albert Road, Hallam, 3805

3ZIN—A. S. Wedgewood, Lot 5, Anzac Road, Warrandyte South, 3134

3ZOO—Scholes, Caligia VK3ZOO Net VK3ZOO

QUEENSLAND

VK4EM—R. L. Ressek, 119 Kate Street, Indooroopilly, 4068

4WX—W. Wharast, Unit 10, Maia Court, 43 Macdonald Road, Margate, 4019

4ZDL/T—Rev. Dr Laver, 10 Church St, Boonah, 4510

4ZRJ—R. Harris, 82A Jubilee Terrace, Bardon, 4065

4ZSR—R. W. Rigg, 81 Surf Street, Mermaid Beach, 4218

SOUTH AUSTRALIA

VK5ZEW—P. J. Wilson, 23 Meribourough Road, Westbourne Park, 5041

5CZ—J. A. Hackworth, 6 Tamar Crescent, Banksia Park, 5091

5ZTS—T. Scholten, F12/15 Wakefield Street, Kent Town, 5082

5WI—Wireless Institute of Australia, SA Division, VHF Group—5 Tamar Cres., Banksia Park, 5081

WESTERN AUSTRALIA

VK6EJ—E. J. R. Cowies, 11 Curlews Road, Bluff Point, 6630

TRAMANIA

VK7SS—P. R. Tompson, 48 Cross Street, New Town, 7008

NORTHERN TERRITORY

VK8DA—Darwin Amateur Radio Club Inc., Postal: PO Box 1418, Darwin, 5794; Station: East Point Reserve, Darwin, 5794

CANCELLED STATIONS VICTORIA

VK3DI—A. F. Moynerta, Not renewed
3JI—P. R. Gilbert, Not renewed.
3TF—R. A. Tozer, Not renewed.
3AFH—J. R. Nugent, Transferred to A.C.T.
3AH—J. C. Eagom, Not renewed.
3AXB—J. Linden, Not renewed.
3R2Z—Wireless Institute of Australia, Vic. Div.
3YEX—A. E. Fisher, Not renewed.
3YFG—D. W. Edwards, Not renewed.
3ZEG—T. S. Grey, Not renewed.
3ZET—R. J. Abbott, Not renewed.
3ZKR—M. J. Carter, Not renewed.
3ZGZ—M. J. Howden, Not renewed.
3ZNG—A. Boyle, Not renewed.
3ZX—D. L. Mitchel, Transferred to Tasmania.
3ZXZ—M. Adlam, Not renewed.

QUEENSLAND

VK4EM—R. L. Ressek, 119 Kate Street, Indooroopilly, 4068 (shown as VK4EN, uncorrected).
4KH/T—K. F. Holtman, 10 Duke Street, Toowoompa, 4350 (shown as VK4HK/T, uncorrected).
4SH—S. T. Henkel, 32 Randal Road, Wynnum West, 4179 (deceased).
4ZHM—H. T. Moores, 6 Thomas Street, Wilston 4051 (Now VK44L).
4ZIT—L. T. Tinney, 19 Fifth Avenue, St Lucia, 4067.

WESTERN AUSTRALIA

VK8BD—J. Solla, Non-payment renewal fee.
6ZHI—P. A. Bradshaw, Non-payment renewal fee.
8AF—RAAF Pearce-Amateur Radio Club, Ceased operations.

MAY, 1974

NEW STATIONS

AUSTRALIAN CAPITAL TERRITORY

VK1YB—P. W. Bowers, 4 McCay Place, Pearce, 2607
1ZBE—N. C. Weisleder, 21 Vogelsang Place, Flynn, 2615

NEW SOUTH WALES

VK2FI—B. L. Maguire, 5 Kimberley Road, Carlingford, 2118
2FQ—H. N. Haistone, 18 Alan St, Sestorth, 2092
2HY—D. G. Hallinan, 2 St. Johns Rd, Bexley, 2774

2AJX—J. W. Wilkomm, 6 Winchester Ave., Lindfield, 2070

2AKP—L. I. Howell, 17 Shawren Avenue, Castle Hill, 2154

2ATJ/T—E. T. King, 5/58A Boronia St, Kensington, 2033

2BFF—C. G. Foster, 223 Clewlow Rd, Clewlow, 2021

2BFO—B. Orr, 8 Glenside St, Brigidown, 2063

2BFF—E. C. Cloudersey, 7 Point St, Bates Bay, 2065

2BZB—S. J. Blair, 17 Deborah Place, Eastwood, 2122

2BZC/T—P. B. Webster, 25 Bayview Avenue, Earlwood, 2206

2BZD/T—J. B. Webster, 25 Bayview Avenue, Earlwood, 2206

2BZE—M. S. Hort, 44 Stratia Avenue, Barrack Heights, 2526

2YC—K. A. Blow, "The Nook", Jacques Ave., Penshurst, 2210

2YC/T—C. J. Erwin, 5 Alisway Road, Pymble, 2073

2YC/G—Archibald, 26 Banghazi Rd., Carlingford, 2118

2YCH—J. K. Gillin, 50 Bunn St., Oak Flats, 2527

2YCI—B. Robertson Dunn, 182 Warrington Road, Beacon Hill, 2100

2YCL—C. G. Levitt, 18 Moorambra Ave., Lane Cove, 2066

2ZJP/T—L. H. The 2nd Powell, Flat 2/55A Carter Street, Cammeray, 2062

2ZNR—N. R. Twyer, 181 Minnie Street, Eastwood, 2172A

2ZPB—P. F. Bell, 2 Neumann Rd., Engadine, 2233

2ZVU/T—J. R. Tranning, 48 Chisholm Avenue, Avalon, 2107

VICTORIA

VK3IL—D. N. Baker, 30 Madden St., North Balwyn, VIC

3APA—F. R. Kent, Fist, 10/18 Minnie Street, Brunswick, 3066

3AWD—W. D. Melrose, 23 The Right, East Ivanhoe, 3070

3YGE—R. A. Morrison, 7 North Gate, Werribee, 3030

3YJD—J. D. Smyth, 28 Clydesdale Street, Balaclava, 3128

3YKH—H. W. Kennedy, 787 Bell St., West Preston, 3072

3ZKO—K. C. James, 27 Gordon Grove, East Preston, 3072

3ZLD—Ludwing, 4/3 Coleridge St., Elwood, 3184

3ZTC—H. E. K. Eames, 100 Wood St, Preston, 3072

3ZW—W. J. Matthews, Lot 13, Browns Road Devon Meadows, 3077

QUEENSLAND

VK4DK/T—C. W. Walsh, 21 Hart St., Mackay, 4740

4OT—D. T. Laurie, 5 Wanawong Court, Ferny Hills, 4055

4YU—K. Dil, 5 Corinna St, Macgregor, 4109

4ZE—M. Joyce, 35 Prout St, Camp Hill, 4152

4WIT—Townsville Amateur Radio Club, P.O. Box 964, Townsville 4810 (See VK4TC below)

SOUTH AUSTRALIA

VK5EC—R. E. Tayor, 19 Easton Rd, Pt Lincoln

5500

5LI—Moonta May—D. Campbell, Rosselier's Road, Moonta Bay, 5359

5PO—J. C. Crawford-Lindsey, 3 Ruylargan Ave, Valley View, 5093

5ZJM—J. F. Mohr, Lot 31 Emmett Rd., Crafers, 5152

5ZIS—G. W. Schultz, 74 Shannon Ave, Gleneagles North, 5045

WESTERN AUSTRALIA

VK6AQ—A. K. Maynard, Stallion, Lot 18 Oxford St., Albany 6330, Postnet P.D., Box 163, Albany 6330

8OC—G. Winter, 42 Shakespeare Avenue, Subiaco, 6008

8ZJA—C. W. Jackson, 10 Traveller St., Wagin, 6315

8ZFM—J. H. Macha, 27 Belmont, Subiaco, 6008

8ZDT—S. W. Lawrence, Lot 24 Streatham Road Mahogany Creek, 6072

TAHITI

VK7KZ—R. J. Geaves, 33 Main Road, Moonah, 7008

7008

NORTHERN TERRITORY

NIS

CHANGE OF ADDRESS

AUSTRALIAN CAPITAL TERRITORY

VK1AC—A. G. Parker, 10 Islander Cres., Flynn, 2615

1DB—D. A. R. Brown, 17 Grace St, Westanger, 2614

1LF—L. S. Fisher, Flat 80, Burnie Court, 3 Burnie Street, Lyons, 2000

1ZMB—B. J. Mayfield, 32 Uluru Forest, Uralla, 2611

1ZPO—P. M. Cohn, 2/2 Burkitt Street, Page 2614

1ZQR—R. G. Gledhill, 8 Cooney Ct, Charwood 2615

1ZWG—W. H. Godfrey, 1 Gore St., Higgins, Postnet, P.O. Box 31, Higgins, 2615

NEW SOUTH WALES

VK2BT—W. H. Kennedy, 818 Myumba Pde., Berseide North, Batemans Bay, 2583

29X—B. G. Warren, 3 Glebeira Parade, Cronulla South, 2230

2FU—G. Pollock, 12 Edward Pde., Wentworth Falls, 2782

2GU—P. G. Arthur, 52 Bungelow Rd, Penhurst, 2227

2GP—G. T. File, 38 Mt Ettalong Rd, Umina, 2257

2HU—N. H. T. Yule, 42 Bighview Road, Presty Beach, 2288

2IV—T. H. Cahill, 21 Georgina St., Bass Hill, 2197

2JP—S. B. Mason, 54 Vaux St., Cooma, 2794

2LR—R. L. Dickinsen, 36 Rainbird Rd., French Forest, 2086

2LK—H. C. Crisp, 18 Latte Street, Gorokan, 2263

2LZK—W. F. C. Bischoff, 37 Merrienburg Avenue, Narembeen, 2885

2MN—C. M. Croke, Back Creek Rd., Young, 2594

2OZ—J. R. Moyle, 572/50 Pennant Hills Rd., Normanby, 2078

What are we doing to ourselves

In between the sweeping generalities in this article, there is a great amount of truth viewed against our 'popular' identity, the performance at ITU conferences of many delegates from African and other countries and the dark clouds of a world frequency conference hanging over us for 1979. Perhaps the Eastern bloc countries are quite right in classifying amateur radio as a sporting activity. (Ed.)

Quite frankly, I am heartily sick and tired of all the preaching going on within the amateur service to justify to ourselves that amateur radio is a good thing. But more, later.

Do you hear footy requiring justification for its existence? Or table tennis? Or chess? Or stamp collecting? Or flying model aircraft? There is public acceptance of these activities as essential parts of everyday existence.

"And what are your interests, Joe?" "Reading, football and going to the beach in summer". "Very good Joe — what else occupies your time apart from work and sleep, don't you bet for instance?" "Oh, yes, I have a dollar a week on Tatts and follow the dogs a bit whilst having a drink with my mates down at the pub".

You see my point? First rate things like reading, watching footy and such like. Then down to the fringe-area things like betting and a drink or two.

Listening to the radio or watching the monster are other socially acceptable activities.

But mention amateur radio and what is the response?

Either it is an unknown activity or you are asked in a derogatory way about being 'one of those hams'. Kindly folk ask what is a ham and what does he do? Perhaps the word 'ham' did us more harm in the public relations field than everything else put together including interference to favourite programmes.

Have you never faced a supercilious enquiry about being 'one of those hams'.

"Oh yes", you say, "and I gave him a really expert run down on amateur radio which he won't forget in a hurry". "Did you — good on yer mate". Like to take a bet on his reaction to your good intentioned preaching? Did you hear him later in the week talking to his friends about meeting some ham bloke — 'must have been a real nut-case the way he shoved the stuff down my throat'.

In the public's mind is amateur radio an activity rated below the fringe area even?

If it is — why?

I'll tell you.

We have fallen down badly with our public relations work. Not merely lately but most of the time. Are we so wrapped in our hobby, so self-centred or so introverted that we have no time to publicise ourselves. What are we? A mob of rabbits for ever burrowing underground instead of shouting our excellence from the roof tops? We claim to talk to the world

but where do we hide publicity to the ordinary man in the street?

What does the public know — or care — about the OSCAR programme? Did officialdom see to it that amateurs received no mention for their part in the recent Queensland floods? What could a good journalist have done with amateur communications for Las Balesas and countless other out of the ordinary occurrences?

Things that are happening now! Not the stale old stuff about pioneering 200 metres and below. Or the vital part played long ago by amateurs in communications by wireless. All this is good stuff but forget it once it is in written history.

OSCAR satellites, moonbounce and other scientific experiments, day to day communications going on with an interesting background. These and numerous variations on such themes should regularly appear in the press, be heard on radio and be seen on television. But for sure, ban that word 'ham'. It has lost any value it once had. It is no longer funny — just as Tony Hancock's "It's raining in Tokyo" is dated. Incidentally, the use of 'that word' is to be discouraged on no less an authority than through a policy of the WIA Federal Council.

What are we doing for the young? What are we doing for beginners? What will we be doing for Novices? Are we so smug and so elite, so privileged, so know-it-all that we have no patience with anyone aspiring to climb the ladder below us?

What are we missing in the schools? It might be too much to expect amateur radio to be an examination subject but apart from a few dedicated individuals manning the occasional YRCs activity or a 'big deal' once a year appearance by a few people on JOTA what are we doing for the young?

Hit and miss methods hopefully believing that an occasional teacher in equally few schools will fire up enough enthusiasm even to inform students about amateur radio are no longer good enough. Every school ought to know something about Oscar satellites and how easy it is to climb on this bandwagon of exciting experimentation to broaden the pupils' knowledge of the world around him (and her, too).

No, we go around hiding our talents. Because we are 'amateurs'? Is the word 'amateur' as great a misnomer round our necks as the word 'ham'? Everyone must have heard the expression 'he came up from the world of amateurs'.

I submit we must do a big job on our public relations, our beneficial effects and our potential value to the community. And

Peter B. Dodd, VK3CIF
1308 Glenhuntly Road, Glenhuntly, 3163

this applies to you, and you and you over there as well as to WIA activated publicity constantly flooding the media until they sit up and take notice of us.

All this is very different from sitting supine in your operating chair hoping the other bloke will do something; reading in our amateur magazines about the benefits of amateur radio and how can we stave off disaster by convincing ourselves we are, after all, splendid blokes full of knowledge and world-wide bonhomie; what the great 'we' have done and hope to do.

Amateur radio is not a secret society. The activity is not allied to black magic, witchcraft or any other little known fad or occult art. Sure, we have some mystic language but this is necessary fun, part of the game. We talk openly, even with Russians, but we are not communist spies as an article in the "Sun" of 18th March seemed to imply from a British Defence Council Report.

This article is intended to stir every right-thinking amateur into doing something about our public image. Not only now, not only next week, not only next year BUT ALL THE TIME, mate. Despite our increasing numbers we do not get more frequencies. Without frequencies on which to operate where would we be? Back to growing roses perhaps!

QSP

EMERGENCY COMMUNICATIONS

"It is expected that AMSAT-OSCAR 7 will be used in support of such (emergencies) communications during any such emergencies, as a back-up for HF radio, which is highly dependent upon favourable ionospheric conditions". Amat Newsletter, Sept. 74.

heading north in 75?

Why not time your visit to coincide with the second bi-annual North Queensland Convention to be held by the Townsville Amateur Radio Club?

TOWNSVILLE — City in the Sun
Time: 26/27 JULY, 1975

Essential Equipment:

- (1) Mobile HF gear to join in the TARC nets while travelling to Townsville.
- (2) Mobile VHF gear for use in the city.
- (3) Homebrew items for entry in the competition

(YL/XYL section also, not necessarily electronic.)

Registration details in 'AR' early 75.

What to do with that old receiver

That old radio that Uncle Bob gave you, what can you do with it? Ever thought of making a Signal Tracer out of it? This is how you do it. If it is a superhet type, you can make it do at least 5 things.

1. A signal generator.
2. An RF probe tracer.
3. Detector output of set is used to apply to any amplifier.
4. Use the set's audio output for testing other gear or as a PU amp or can be used with hi-level output microphone.
5. Lo-level output.

You will need a switch with 5 positions. 2 x 100pf mica condensers. 3 x .05 condensers (Philips polyester) value not critical. Use at least 400v working type. Quantity of coax. (75 ohm or microphone cable) PMG jack and plug and a home made probe (out of a ball point pen shaft).

By connecting a 100pf condenser to the oscillator section of the tuning gang, you pick up the RF generated by the local oscillator of the set. This should be good until at least the third harmonic (see table)

and if you use a list of broadcast stations you can work out what generated frequency you are on or what harmonic. This is very handy as a rough check on your short wave receiver, or for lining up.

Make a probe out of a ball point shaft. Plug one end with some insulating material and insert a knitting needle or a bodkin. Solder your coax. to this and the other end of the coax. goes to a PMG jack plug.

Don't forget to earth the shielding. When the S/W is in the No. 2 position you can use this probe to pick up RF signals on another receiver. If you have trouble in the RF section of a set, use the probe by tracing a signal until you get nothing and then you start looking at that particular section for trouble.

The aerial is disconnected from the tracer whilst tests are being made with the exception of the No. 3 position.

Dial	Oct.	2nd	3rd
Tuning	Osc.	Tuning	H'monic
550 KC	1005 KC	2010 KC	3015 KC
3AR (620)	1075 "	2150 "	3225 "
3LO (770)	1225 "	2450 "	3875 "
3AW (1280)	1735 "	3470 "	5205 "
3AK (1500)	1955 "	3910 "	5885 "

(with set using 455 KC I/Fs)

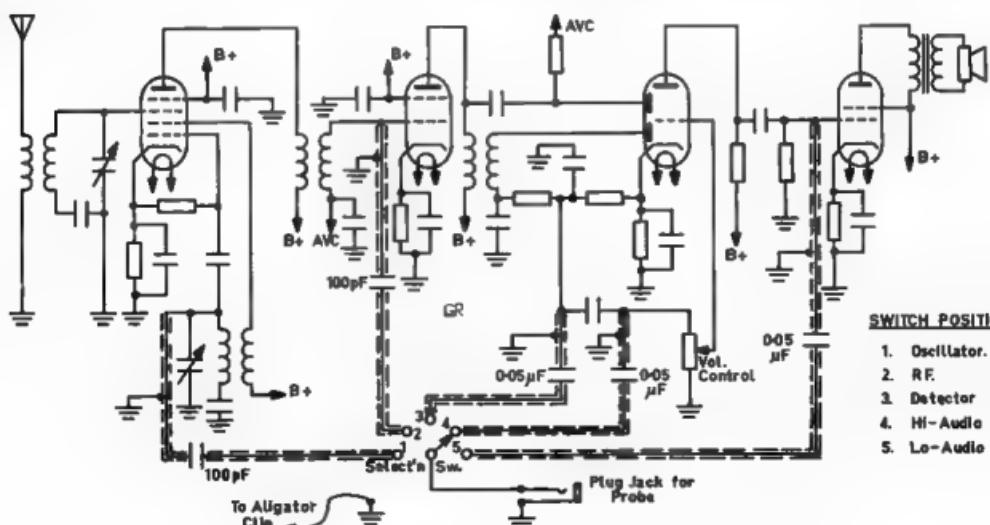
By Harry Roach
Reprint from Zero Beat, April 1970

I realise that there will be many types of superhet about and the types of valves will vary enormously, but the principle is the same throughout. In this diagram the first valve is the Mixer, the second is the IF amp, the third is AVC DET. and 1st Audio, and the last valve is the Output amplifier. The rectifier is not shown.

When making connections to the switch place the condenser as near as you can to the component or element and the length of shielded cable is then earthed near that point and the rest of the cable run to and joined at the switch. A length of about two feet joined to a crocodile clip makes up the earth lead and this can be soldered or just plugged into the chassis.

If you like this idea and give it a go and find it successful you can later on make a more sophisticated tracer by using most of the equipment again but altering some of the coils and switches. Try this first. The main thing in getting this going, is to get a copy of the circuit of the receiver (if you can) or get some friend to help out with where to put the connections on. It looks a bit hard, but it really isn't.

BELLOW: A standard circuit for pre-solid state broadcast receivers.



Commercial Kinks

with Ron Fisher VK3OM
3 Fairview Ave., Glen Waverley, 3150

FT101 VOX OPERATION

It's now quite a while since we discussed the FT101. Perhaps it is indicative of the reliability of these rigs that very little is ever heard of serious problems or the need for odd modifications. To start with, in this present discussion we will look at the adjustment of the VOX circuits. Earl Lagergren K70EP, DL4LE and VK2EP devised the following and Les VK4LZ forwarded it on to me.

"Recently I had the pleasure of visiting with Les VK4LZ, and came across the following problem with his FT101. Since this appears to be a common problem and prevents many fellows from using the VOX, I thought I would pass along my experiences with it. Lee's VOX would operate satisfactorily for a few minutes and then slowly hang-up."

Looking at the VOX schematic on page 17 of the instruction manual, you will see that the VOX relay is controlled by a bipolar transistor (Q6) which will operate the relay as soon as the base voltage increases above about 0.7 volt. The base voltage is controlled by the action of a junction FET (Q5). In the following manner: with no inputs from either the VOX or anti-trip circuitry, the voltage on the gate of Q5 will be zero. With zero gate voltage the drain voltage of Q5 and therefore the base voltage of Q6 will be a factor of the drain load resistance R25, the particular FET characteristics and the source bias determined by the value of VR3.

Let us assume the source bias pot VR3 RELAY is adjusted so that the quiescent drain voltage is 0.4 volt. Any speech from the mike will be amplified by the VOX amplifier and rectified by D1 and D2. The gate voltage will no longer be zero, and as it goes in the negative direction the drain voltage will become more positive. As soon as the drain voltage increases from 0.4 to 0.7 the VOX relay will be activated. With no further speech input this voltage will fall back to 0.4 volt and somewhere along the way the rig will switch back to receive.

This is the problem. If the base voltage as adjusted by VR3 RELAY is too close to the turn-on voltage of Q6, then any slight drift may cause the transceiver to hang-up in transmit. However, if the RELAY pot is adjusted too far in the other extreme, too much VOX gain will be required and the

VOX may not operate on the first syllable.

The best method of adjustment is as follows: with the receiver audio gain turned down speak into the mike and turn the VR3 RELAY pot fully counter-clockwise. This should cause the rig to hang-up in transmit. Now slowly turn the pot clockwise until the relay drops out and then turn it a fraction more to take any drift into account. Now advance the VOX gain pot VR1 until the VOX actuates on the first syllable. Turn up the receiver audio gain, tune in a strong signal, and advance the anti-trip pot VR5 until the relay stops chattering. It might be necessary to play with these two pots a bit. However, it is much better to keep the mike and speaker separated and use only a little anti-VOX than to put the mike right in front of the speaker and need too much anti-VOX."

IMPROVED CW OPERATION FOR THE FT101B

Try This

with Ron Cook VK3APW
and Bill Rice VK3ABP

KP202 RF POWER AMPLIFIER

A power amplifier is useful when using the KEN KP202 as a mobile or base. This is best done by using an RF switched power amplifier between the KEN KP202 and the antenna.

The amplifier unit consists of a relay driven by an RF Sensor and uses a 10W class C transistor RF power amplifier. The

Tom House VK2BTH makes a simple suggestion for CW operators lucky enough to own an FT101B.

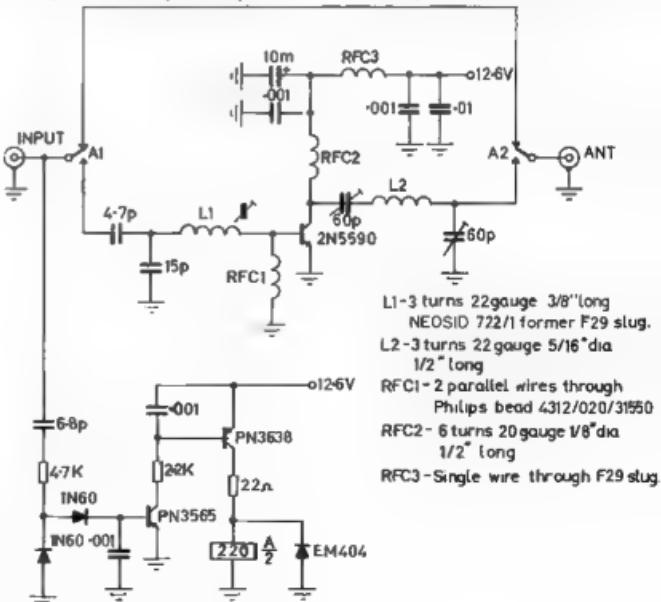
"Owners of the popular Yaesu FT101B transceiver who like both CW and SSB will probably have noticed that unless the microphone is unplugged when operating in the CW mode, the VOX tends to cycle on and off. A simple remedy is, on switching to CW, to turn the mic gain fully clockwise (maximum). A perusal of the circuit diagram shows that this effectively shorts to earth the output of the mic stage to the VOX amplifier when the unit is receiving. It allows the microphone to be left permanently in place, thus avoiding much tiresome and time-consuming pulling and tugging."

Remember, when reverting to SSB, to return the mic gain to its normal position.

RF power amplifier is a 10 watt RF Power KEN (Dick Smith Electronics) which uses a 2N5590 transistor. If higher output is desired a 25 W board could be added on also.

The changeover relay is actuated by detecting the RF from the KEN, and using this to drive the relay via a DC amplifier. The relay used was a small cradle relay with low capacitance and high current contacts. Suitable relays may be obtained from Siemens and other sources.

The amplifier was simply peaked up for output and produced 9 watts output for 12 volt supply and 1.5 watts drive. But 14 volt supply and 1.6 watts drive produced 12 watts output, so keep the battery volts up.



L1-3 turns 22gauge 3/8"long

NEOSID 722/1 former F29 slug.

L2-3 turns 22gauge 5/16"dia

1/2" long

RFC1-2 parallel wires through

Philips bead 4312/020/31550

RFC2-6 turns 20gauge 1/8"dia

1/2" long

RFC3-Single wire through F29 slug.

FOR SALE

52 MHz 144 MHz 432 MHz Swan Yagi Antennas in Kit Form used by many 144 MHz Moon Bounce operators in USA. Also large quantity aluminium tubing.

Write

"ANTENNAS"
Box 80, Birchip, Vic. 3483

Newcomers Notebook

with Rodney Champness VK3UG

44 Rathmullan Rd., Boronia, Vic. 3155

This month I have a few more short circuits from Zero Best.

JUNE 1969 HARRY SMITH VK3XZB. An ordinary, cheap, glass cutter (disc roller type) makes an excellent tool for cutting aluminium sheet. Some care must be taken to score both sides opposite each other then flex until it breaks at the score. In most cases, and especially if the sheet is large, it pays to clamp the aluminium between two pieces of timber of appropriate size. Try putting one end in the vice and fix the other with a G clamp, or use two clamps.

JUNE 1969. Correcting fluid designed to cover mistakes in typed mimeographed stencils can also be used for repair of small tears and holes in speaker cones. The solution is inexpensive and can be purchased in small bottles from any of the office supply stores.

AUGUST 1969. Winding coils with enamelled wire and having trouble cleaning the ends for soldering? Then try this. Heat the area you want to strip in a methylated spirit flame. A small jar with screw lid with a wick through a tight hole in the top will do as a burner. When it is red hot dip it into some cold methylated spirit and you have a perfectly cleaned wire.

AUGUST 1969. After applying decals (transfers) to a panel, cabinet, etc., fix them to ensure their permanency. Use a small camel hair brush to apply a small amount of acetone fingernail polish remover, or lacquer thinner to the decal. Use just enough solvent to dissolve the clear decal backing.

APRIL 1970. Where there is not much room to work, replacement transistors will be easier to insert if the leads are staggered, that is cut each lead a little shorter than the other. This allows you to insert only one lead at a time instead of trying to manoeuvre three leads through three holes all at once. The excess length can be cut off after the leads have been soldered.

APRIL 1970. One neat and simple method of providing tape on hand wound coils is to make a loop in the wire and twist it two or three times. Continue on with the coil to the end and cut the loop on one side near the twist, clean the twist and solder. The piece of wire in the loop gives you your tapped lead. ●

Letters to the Editor

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

The Editor,
Dear Sir,

Brian Hamann's letter in September issue has spurred me to write about the problems of the associate members in the WIA. I cannot but agree that associate members do receive a raw deal — at least in Victoria. Some three to four years ago a delegation from the Eastern Zone at a special Divisional Council meeting brought up this very point, and the additional point the associates have no voting rights even in matters which affect them etc.

The membership fee which now stands at 70 per cent of full membership fee is unjust considering the reduced privileges the associate receives. They have no voting rights on any subjects, their WIA listeners numbers are not published, there are few articles in AR which are of value to them. I am not sure but I think they pay to the IARU, they pay for part of the Federal conventions at which their affairs are not discussed, and they have no need of the help of the TVI committee or to receive assistance in dealing with "problem" neighbours. It was with these things in mind that the Eastern Zone broached this subject. The Eastern Zone was told that it cost just as much to administer an associate as a full member and that there could be no consideration of associate having no voting rights on subjects that concerned them. The inference was more foot the associates for belonging to the WIA. Regrettably, I have no reason to believe that the Victorian Divisional Council have changed their minds on the importance of the associate in the whole scheme of amateur radio.

I believe that a membership fee of 70 per cent or thereabouts would be reasonable for an associate to pay, for what they should get out of the WIA and for what they should put into the WIA. It cannot be just a one way affair. For example, on investigation it appears that the listeners numbers were dropped from the callbook because they were inaccurate either through the WIA records or this nature assuming a low priority, or the associates did not advise the WIA of changes of address and such like. Why don't the people who are interested in this listing get together and make up the necessary amendments and we to do the same. Perhaps an approach could be made to the Editor of AR to determine whether each Division could submit an Insert for each State of the listener numbers, names and addresses in much the same way as the callbook amendments are done. The system I envisage would be that VKS would only receive the VKS list of listeners, likewise VK3 only the VK3 listeners and so on.

I couldn't agree more that the content of AR directed towards associate members is relatively small. However, Newcomers Notebook is aimed at the associate and the newly licensed amateur. Regrettably very little feedback is received to determine whether or not this column is filling this need. I have appealed from time to time for help with the column and have been despatched by the silence of people speaking up and offering. I have very little time to prepare articles, a co-author would be welcome. The magazine would be most desirable. I cannot recall when I last saw an article written by an associate. It is difficult for a licensed amateur to write for people with significantly different interests to his. The associate member must contribute more to the magazine, not just because the fact that there is very little to interest him in AR. The SWL notes did a natural death through lack of contributions by the associate members.

Perhaps the whole outlook of the WIA executive, divisional councils, ranks and the amateurs and the associate members should change concerning what role the associate plays in the WIA. The associate grading should be the way in which a radio enthusiast is introduced to amateur radio. I believe that the person we are aiming to attract to the broad spectrum of amateur radio knows nothing of it — because of lack of publicity on our part. These people of whom we know nothing would join as associates and a large proportion would

likely become amateurs. We need good publicity followed up by good educational courses in amateur radio. These two aspects will be most important when and if the Novice certificate comes in. Quite a proportion of the 27 MHz pirates might not have been pirates if we had had some publicity in the World at large, and courses of instruction to help them on the way to amateur radio. I estimate that there are more pirates than licensed amateurs. Wouldn't it be good if most had become amateurs instead of pirates? Have we lost these people because of our "closed house" attitudes, I say in many cases we have.

To recapitulate (1) The associate member has my support for a lowering of fees in his case, and I am sure other full members would too. In such case contact sympathetic amateurs in your area. If at this point can't see your way forward if you don't contact full members you cannot expect their help.

(2) I believe that associates should have voting rights but only on those things which directly concern them.

(3) Associates themselves need to push for the re-introduction of the listener numbers.

(4) Associate need to contribute more to AR if they want a fair coverage of items of interest to them.

(5) The WIA in total needs to look carefully into the role of the associate as it is and what it should be.

(6) The WIA needs to publicize amateur radio much more widely than it does currently, and perhaps steer young people who might go pirating on the road to amateur radio.

(7) The WIA needs more and better instructional courses for radioelectronics enthusiasts. Perhaps the Government could be persuaded that these types of courses should be subsidised under the free tertiary education scheme.

(8) These particular points become increasingly important with the possibility of Novice Licensing.

Think these points over whether you are a full or associate member. The time for change is perhaps already upon us.

Rodney Champness, VK3UG

The Editor,
Dear Sir,
I was intrigued with the problem raised in the letter to the Editor of AR, July 1974, by VK6TUV. and have given a few thoughts to it.

I have not seen the reference quoted from the "Radio Communication Handbook", hence I do not know as to what type of valve or circuit conditions to which it applies.

The statement is correct in relation 10 a type B13 beam power valve used under class C conditions with a very stable independent screen grid power supply. This was verified in a practical test with an B13. When tuning the plate circuit through resonance, the plate current dip and the screen grid current peak occurred together.

The relevance that in the ampifier no grid current was flowing, indicates that the B146s were being used in either class A or class AB1, and probably they are parallel connected. No reference to the type of drive being used was made. i.e. grid or cathode drive.

The B146 is a little different in one respect from other beam power valves. It has a rather low screen grid impedance. It is this which makes screen grid modulation slightly more difficult than, say, an 807, for AM.

I have extracted the following data for a pair of B146s from a valve manufacturer's data sheet for class AB1 operation under ICAS conditions.
Plate Voltage 750 V.
Screen Voltage 200 V. Preferably obtained from a very stable power supply, either independent or extra well regulated.

Control grid Voltage 50 V. Again preferably from a well regulated supply. Cathode bias is not recommended.

Plate current. Zero signal input. 57 mA, maximum signal input 227 mA.

Screen grid current. Zero signal input. 7 mA, maximum signal input 27.5 mA.

Power Output 120 watts.

Assuming that the B146 behaves as stated in the handbook, the problem may be due to any of the following:

Screen grid voltage not sufficiently stable. This is vitally important as variations in screen grid voltage have more effect on plate current than

GSP

THE MURKIN MASTERS

Radio telephony weather broadcasts radiate from the Sydney area on 3432, 6820 and 10017 kHz at each hour and 30 minutes past each hour. The broadcasts on 3432 and 6820 are good markers to determine whether 80 m and 40 m bands are open from your QTH to VK3, especially the Sydney area.

variations of plate voltage. (More so than in a triode.)

Screen grid current supply from power supply insufficient, as the power supply voltage may be reasonably stable even if the power supply cannot provide sufficient current.

Control grid bias was not sufficiently stable.

Use of cathode bias (Cathode drive systems can introduce unsuspected cathode bias because of the ohmic nature of the drive circuits.)

Control grid resistance is excessive. If used, suggest a change to RF choke.

Use of paralleled valves. It may happen that unity power factor does not occur at resonance. Quite common with paralleled triodes.

Output loading not tight enough.

Trust that these notes may help in solving the problem.

Chris Cullinan, VK3XU

The Editor,

Dear Sir,

I noted with interest the listing of top scores for the 1973 CO WW WPX Contest (P20 AR, August 1974).

It may be of some interest to you that I was successful in obtaining "second world high" in that contest as single operator on 21 MHz with a score of 343 - 826 points operating as VK3RY (P20RJ since still government). I am sure the range of equal interest (and I trust encouraging) must be the contest participants is the fact

I throughout the contest my final PEP to the antenna never exceeded 200 watts. The antenna is a "home brew" 8 element monoband Yagi with a 34 ft boom (Believe it or not) for the past five years has been rotated unerringly by a Simple Rotator!

The same combination was used on 21 MHz for the 1973 VK-ZL Contest.

Ron Johns

P20RJ/ex VK3RY/ex VK1RJP

MWIA and foundation member of Radio Society of Papua

The Editor,

Cairn Star,

I would like to say that I am in agreement with Brian J. Hannan's letter which was published in AR for September 1974.

I cannot see why Associate members should pay \$1750 a year to join the WIA which, as Mr. Hannan stated is only 50c less than a full member. The associate member (as far as I can see) does not have a say as to how the money the WIA gets is spent, and is not liable to vote on any matter that will affect him when he obtains his Amateur Licence. Neither can he get a concession on a ham band or general coverage receiver as do full members if they import a transceiver into the country.

There must be several associate members that are more interested in the listening side of amateur radio. That is, sending reports to amateurs and receiving QSL cards, and through no fault of their own are not able to study to become an Amateur.

There must be also a number of associate members apart from those sending QSL cards to amateurs, who enjoy reading AR, and have to join the WIA to obtain it, as it is not available through book shops or newsagents.

The only advantage I can see that associate members get from the WIA is the non-postage on QSL cards. I am not sure that the WIA members do them a good job for the twin licensed Amateurs.

The same thing happens in NZ where the associate members pay 50c less than the "transmitting" member. Although both have to pay 10 per card to be sent through the NZART Bureau, they also have no voting rights similar to the associate member in Australia.

73 Barrie Royce L3-425

(Licensed Amateurs in Australia are also liable to contain concessions on receiver imports. The matter is still being pressed. — Ed.)

The Editor,

Dear Sir,

Rising Prices.

I have for some time tried to wage a private war against rising prices of items offered for sale to Amateurs. This was made possible by a number of devices and the fact that I considered this matter a leisure activity to make available certain products to Amateurs whose workshops lacked metalworking facilities.

It is now necessary to report that this policy cannot be continued indefinitely and new prices, about 1/3rd higher will have to be charged as soon as presently available stocks (four only) of Quad kits and other items are sold.

The need for this action is regretted but, with rapidly rising prices for raw materials of all types, it is impossible for me to maintain prices at present levels.

Syd Clark, VK3ASC

Magazine Index

With Syd Clark, VK3ASC

BREAK-IN June 1974

Ideas for Building Transceivers; Galbraith Counter; GPO Meter; etc.

Senate Bank Snare; The RME Success Story; Another Approach to Lightweight Yagi Construction; Determining Resonant Lengths of Transmission Lines; Corp's Columns (How it is ISS SSTV on one and voice on the other).

HAM RADIO May 1974

Log-Periodic for 15 and 20; Parabolic Antenna Design; Antennas and Satellite Communications; Antenna Ground Systems; Antenna Measurements; Three Band DX Vertical; 100 Metre Receiving Antennas; 5/6-Wavelength VHF Antennas; Antenna Tuner; Vertical Radiation Patterns; PI Network Design.

HAM RADIO June 1974

Cosmos Electronic Keyer; Better Receiver Design; Function Generator; Coherent PSK RTTY; Two-Modes Pre-amplifier; Optimum Height for Horizontal Antennas; Local Oscillator Waveform Effects; Understanding Sweep Oscilloscopes; Private Line for the Hamfest; HY-3000; Diode Beam Deflectors.

RADIO COMMUNICATION June 1974

Some Interesting Uses for TAA861 Integrated Circuits; The Heathkit HW202 244 FM Transceiver [Review]; Some Thoughts on True Break-In for CW and SSB; Building Blocks for the Novice.

BREAK-IN July 1974

Ideas for Building Transceivers, NZART Conference Report.

RADIO COMMUNICATION July 1974

The "Normal-Mode" Helical Aerial, A Digital Frequency Display Unit; Building Blocks for the Novice.

SHORT-WAVE MAGAZINE June 1974

Modifying the FR-50; Microphone Pre-Amplifier; Third Meltron SSB Exciter; Paraboloid for Twenty-Three.

QST July 1974

A Circuit Generator for ATVs; Learning to Work with Semiconductors; EME Scheduling, When and Where, A Fence Mount for Vertical Antennas; The Elco 752 Rides Again; More Receiver Design Notes; Part 2; A Poor Man's Electronic Tower Hinge; Heathkit HW-202, Spectronics DO-1 Digital Display, Incus IC-230; Wind Force on a Yagi Antenna.

73 MAGAZINE June 1973

Poor Man's Quad; Reconditioning the Long Squared Quad; Antenna Wind Indicator; Matching: Remotely Tuned Antenna Coupler; A Practical Ground System for 160; Wide Range Antennas; Tener; Old Antennas and New Baluns; A multiband Ground Plane; Mod Quad for Frustrated Cliff Dwellers. ●

New Products

Information is to hand on a new range of five multi-purpose general purpose power transformers from Ferronics.

Two of the transformers have two independent 0-12-15 Volt windings while the other three have either two 0-25-32.5 or two 0-35-50 volt windings.

Outputs from 3 to 70 volts and to 10 amps are available using different arrangements. The 15 volt units are available in 75 VA (2.5 A amp per winding) and 120 VA (4 A) while the 35 volt units come in 165 VA (1.5 A), 210 VA (3 A) and 360 VA (5 A).

All except the 120 VA unit are fitted with electrostatic screens and all comply with A.S.C. C 126.

The sample provided was up to spec, well constructed and quiet.

This range should prove most versatile and useful for the amateur. ●

Intruder Watch

with Alf Chandler VK3LC

1536 High Street, Glen Iris, 3146

This month I have a group I am getting far too few reports of intruders.

This is not because intruders are not in our bands, but because most Members are apathetic towards reporting them.

That is very bad show!

One ray of sunshine has emerged though On 14150 kHz daily, except Sundays, from 9 a.m until 10 a.m. Melbourne time, VK3UE controls a net in which many stations participate, either momentarily or prolonged, and he has agreed that any Member who has heard an intruder and wishes to pass on the news can call in on the net and, either as off my net, can talk to the particulars. This is great news, forward, and I have already had several interesting reports.

Also, another method which I am pursuing, and one that takes the onus off Members writing out reports on the forms supplied, is for Members to telephone me. My number is 50 2556 in Melbourne, but please do not ring after 9 p.m. in the evening. When you hear an intruder just take a note of the following: Date and time QMT; Frequency; Mode; Signal strength; Call Sign (if identified); any traffic heard, and if possible the bearing ex your CTH. Also, on first reporting, I shall require your type of receiver and its IF frequency, and an indication whether you mind me mentioning your Call sign because I shall wish to sign the form as yourself per nell!

In Brisbane Murray VK4KKX phone No. 36 5385; in Perth Ross VK8HOA No. 24 2909; in Adelaide Lyle VK8LG No. 276 4724; will take any calls that you wish to make.

Some members seem to think it futile to report intruders. This is far from the truth, and it is to the credit of the WIA Intruder Watch that some stations have been removed from our bands. A notable example is KU3 who, by the RTTY read-out submitted by a Member Observer, was reported to RSGB who in turn circulated upon the Yugoslavia Government, and the British Administration and had the stat an removed.

I may be a little premature, but it is some time since the Indonesian stations 7BD2 etc. on 14080 kHz have been heard. Don't for a moment think that Amateur frequencies are the only ones occupied by intruders. I have been supplied with a page from the document RM682 — "The Board [IRFB] shall prepare periodically, for publication by the Secretary General, summaries of the useful monitoring data received by it including a list of the stations contributing the data". This double sided page which is pages 297 and 298 covers from 13602 to 14855 kHz, and is full of intruding stations mostly only identified by country.

An interesting feature is that those identified have similar Call signs to those heard in our bands by Amateur Observers. So you see the necessity and the advantage of reporting those nefarious intruders.

Stations reported August through September are as follows —

21213	AT	FUJ	— calling FAAG with weather report in French.
14040	A1	— calling JPB	— stopped when QRMed.
14046	A1	HAY	Vs. High speed CW
14070	A1	—	5 figure code.
14111	F1	RTTY	
14120	A1	—	Letter and figure code.
14131	A1	VLUH	— calling 3NII.
14135	A1	VLUU	Vs and QRO, GRZ.
14150	A1	DHQO	— calling DUNC. 4 letter groups.
14152	F1	RTTY, 100 baud, 500 shift.	
14182	A1	—	Letter and figure code.
14184	F1	RTTY	500 shift.
14240	A1	DO2B	
14253	A3	—	Foreign broadcast.
14256	F1	RTTY	500 shift.
14334	A1	MNYK	— calling 5NII.
3616	A3	—	Foreign broadcast.
3645	A1	AAQG	— calling OD9X.
3649	A1	—	4 figure code.

BD	100	48	AB	60	42	PS	24	24	ZK/Y	34	34	GD	22	9	JO	8	8
ZV	148	46	ZNH	67	67	WW	19	14	LE	29	11	A/WI	19	19	RC/8	27	9
ZE	148	62	FA	65	41	CS	23	6	OR	25	12	NE	19	19			
WN	141	79	JO	83	30	ZBE	22	22	NA	25	6	ZDF	10	10			
AH	140	41	EQ	63	21	ZKP	22	22									
DZ	139	50	ZKS	60	60	ZMR	22	22									
KH	138	65	QE	60	30	ZTK	20	20									
TW	138	60	ZCV	58	58	VH	20	7	CT	2073	722	NK	587	167	RL	230	75
MT	131	92	GZ	56	21	ZTT	19	18	RU	1284	455	ZZ	537	191	NX	212	81
FO	131	32	ZDL	53	53	UL	19	12	MA	1198	426	EJ	401	153	CR	106	32
JU	129	51	GX	62	62	WA	19	6									
SD	128	37	TU	61	31	ZOO	18	18	ZE	928	215	OJ	280	127			
CL	123	74	ME	61	30	ZL	17	10	FI	713	246	EG	282	110			
HW	123	40	OO	50	25	WD	17	6									
ZKJ	121	21	ON	50	18	ZAH	16	18									
ZN	118	115	ZIB	49	49	RS	16	10	CW								
AL	116	30	GO	49	49	SA	16	8	WT	1106	216	GA	96	20			
BS	113	33	ZAR	44	48	ZY	16	8	JF	618	132	HO	24	6			
ZAJ	110	110	ZBC	47	47	ES	16	5									
KF	104	49	LW	47	24	UA	16	5									
OC	104	49	IR	44	44	TX	15	15	BR	876	442	BJ	251	75	BF	69	20
ID	107	32	ZHF	48	48	ZSJ	15	15	KJ	659	256	EB	236	11	FB	58	27
DE	104	35	WK	45	22	ZKZ	14	14	HJ	573	203	ZIF	191	74	ZJG	51	51
ZB	102	63	LO	41	22	ZKX	14	14	MX	587	248	DA	149	70	ZDA	50	39
GF	102	38	ZDT	41	41	ZFX	14	14	LH	547	243	DM	127	50	ZHE	29	29
AC	102	30	PG	40	20	ZMC	14	14	KH	544	200	CF	112	57	ZAD	26	26
JR	101	64	WM	36	12	ZHS	13	13	MZ	503	134	SE	91	54	ZWD	24	24
XV	99	46	ZJF	36	36	ZLH	13	13	AX	483	243	ZBY	84	84	ZLD	23	23
PL	99	39	EB	37	31	ZLA	12	12	GW	481	110	ZGG	78	78	TT	9	9
DP	87	32	IB	58	11	ZAQ	12	12	CH	387	164	LY	74	29	ZMF	6	6
N	98	29	OT	58	11	ZTX	12	12	JU	286	144	DW	73	32			
KT	95	29	ZKT	34	34	ZDI	19	10									
LS	95	95	ZK	34	34	ZLO	19	10									
PI	94	30	ZIM	32	32	ZK	9	6									
HH	91	33	KW	32	10	ZNN	9	9									
TO	88	37	ZJM	31	31	AM	8	8									
GW	88	30	UN	31	9	ZFM	8	8									
RI	88	29	ZEF	30	30	ZIS	8	8									
ZR	88	27	ZJA	30	30	BT	8	6									
PV	83	36	ZLK	30	30	PG	7	7									
LC	83	28	ZPS	30	30	CJ	6	6									
PS	83	31	ZAW	29	28	MK	6	6									
HD	80	28	ZP	28	28	HL	6	6									
VS	79	20	RW	28	15	OP	6	6									
ZNH	78	75	MB	27	27	ZMK	5	6									
RY	78	21	ZHR	26	26	JF	5	6									
QG	75	58	DO	26	8	RL	5	6									
ZD3	74	74	ZBM	25	25	CV/4	61	31									
PQ	74	32	ZPS	25	25	CV/4	61	31									
JE	69	30	RP	28	14												

Oscar 8

NO	1878	555	QI	679	135	RK	178	63	CW	HA	366	88					
	1337	383	RC	485	145	MA	15	8	Phone								
BO	878	262	RR	270	106				DJ	1479	440	DM	577	207	CA	316	102
XX	656	266	HM	287	76												

Contest Calendar

CONTEST CALENDAR

Nov 10 Czechoslovakian
Nov 16/17 ARRL Phone Sweepstakes
Nov 25/26 CO WW DX CW
Nov 30 16 metre ground wave test
Dec 7/8 Topo CW
Dec 7 Rose Hull Memorial
Dec 14/15 ARRL 10 metre

ARRL 10 Metre

MN GMT Sun Nov 10 to 2400 GMT
Phone CW all bands

Categories: Single op, both single and alt band.
Multi op all band only.

Scoring: One point per qso, 3 points if with Czech alt. Multiply total by sum of ITU zones worked on each band. Certs to top scorers in each category in each country. Logs to Central Radio Club. Box 60, Praha 1, Czechoslovakia by Dec 31st.

The following equator crossings are for Oscar 8 "ee" orbits over Australia for November 1974. The satellite is "ee" Monday night, Thursday night, Saturday night and Sunday morning local time.

Times given are U.C.T (Z) but days are local. Figures have been corrected to latest NASA predictions.

Orbit No.	Time Crossed (Z)	Equator		Equator	
		(+W)	(-W)	(+W)	(-W)
Set. 2nd	0726.71	190.8	9838	0547.72	160.3
	0823.78	198.8	9536	1027.72	206.1
	0346.116.7	218.1	9450	1237.71	237.5
Set. 6th	1855.66	248.6	9843	1822.7	324
	1858.66	333.1	9564	2017.69	352.8
	1803.67	205.2	9445	1221.69	21.5
	2244.67	90.6	9546	0007.66	50.3

Orbit No.	Time Crossed (Z)	Equator		Equator	
		(+W)	(-W)	(+W)	(-W)
Set. 9th	0723.57	189.3	9563	0542.55	179
	0818.55	188	9584	1037.55	207.5
	1113.58	216.8	9585	1282.57	236.8
Set. 10th	1306.58	245.5	9873	0737.58	182.7
	0813.56	171.7	9425	0813.56	191.5
	1008.55	200.5	9426	1127.36	220.2
	1202.55	229.2	9427	1222.36	249
	1958.54	258	9428	1322.36	249

Orbit No.	Time Crossed (Z)	Equator		Equator	
		(+W)	(-W)	(+W)	(-W)
Set. 11th	0722.57	188.3	9525	0732.24	181.4
	0818.55	188	9526	0827.23	190.2
	1113.58	216.8	9527	1122.22	218.9
Set. 12th	1307.58	245.5	9425	0813.21	199.2
	0813.21	227.9	9426	1317.22	247.7
	1353.52	256.7	9453	1353.52	256.7

Orbit No.	Time Crossed (Z)	Equator		Equator	
		(+W)	(-W)	(+W)	(-W)
Set. 13th	1743.19	314.2	9531	1903.28	358.8
	1833.18	342.9	9455	2052.67	2.7
	2133.16	11.7	9457	2252.19	31.4
Mon. 25th	2358.17	40.4	9458	0727.11	180.1
	0803.08	168.1	9459	0922.09	188.9
	0908.07	197.8	9460	1127.36	217.4
	1153.07	228.5	9477	1303.07	248.4
	1348.06	255.4	9478	1348.06	255.4

Orbit No.	Time Crossed (Z)	Equator		Equator	
		(+W)	(-W)	(+W)	(-W)
Thurs. 14th	0802.86	170.4	9510	1011.88	201.3
	1047.86	210.3	9514	1047.86	210.3
	1242.85	239.1	9515	1242.85	239.1

Orbit No.	Time Crossed (Z)	Equator		Equator	
		(+W)	(-W)	(+W)	(-W)
Thurs. 15th	0803.08	168.1	9511	0801.74	171.3
	0908.07	197.8	9512	1006.74	200
	1153.07	228.5	9714	1201.73	228.6

NOTES—These orbits are those that can be seen by the Australian East Coast Command Station (VK3ZDN, Melbourne) and can therefore be commanded on. Additional Western orbits can be seen by VK3A/KG. Western stations will receive these orbits if they are "ee" on the correct night and Sunday morning. To obtain azimuth, elevation and time settings for any OTH in Australia, use the standard orbit predictions for the nearest capital city as printed in AR. It is hoped to provide these predictions and similar ones for Oscar 7 on a monthly basis in AR.

VHF UHF an expanding world

with Eric Jamieson VK5LP

Forreston, Qld. 6205

Times: GMT

NOVEMBER 1976

AMATEUR BAND BEACONS

VKG	VK0RSA, Macquarie Island	52.180
	VK0MA, Meerson	53.100
	VK0GR, Casey	53.200
VK1	VK1RTA, Canberra	144.475
VK2	VK2RTW, Sydney	52.450
	VK2WI, Sydney X	144.101
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTL, Townsville	52.600
	VK4WI/1, Mt. Mowbray	144.400
VK5	VK5BV, Mt. Lofty	53.000
	VK5VF, Mt. Lofty	144.800
VK6	VK6BV, Perth	52.301
	VK6RTU, Kalgoorlie	52.380
	VK6RTW, Cameron	52.500
	VK6RTW, Albany	144.500
VK7	VK7RTX, Devonport	144.900
VK8	VK8VF, Darien	52.200
P29	P29RTW, Lee, Niigata	52.500
JA	JA1OY, Tokyo, Japan	52.500
SD	SD3AA, Suva, Fiji	52.500
ZL1	ZL1VHF, Dunedin	145.100
	ZL1VHW, Warkworth	145.150
ZL2	ZL2VHF, Wellington	145.200
ZL3	ZL3VHF, Palmerston North	145.250
ZL4	ZL4VHF, Christchurch	146.300
	ZL4VHF, Dunedin	145.400

x denotes change of frequency.

Reading the "Victorian VHFer" I note John VK2SHD reports VK8WI in Sidney now being on 144.101 MHz. This frequency has been noted in the Haling and I hope will prove correct. It would certainly be appreciated if changes to frequencies, call signs or locations could be advised to me by those responsible for the beacon as it would help to keep this accurate. The fact that I do care about accuracy of listings should be evident from the fact that I followed up a set of very incorrect listings in the 1974 NZART Call Book, mention of which was made last month. So, beacon officers, please keep me informed.

Band operational news being rather scarce this month, I feel it is just as or more important to give you a couple of reprints this month to help you with your digestion. They are very relevant, and very important, I think you should read on.

The first comes from the QRT edition of "The Victorian VHFer" being the editorial by Mike Goode, VK3BLL...

"THE GOLDEN AGE OF THE BUTTON PUSHER". "Button pushing" ideologies in many respects the current "state of the art". With large numbers of commercial carphones about, the ready availability of specifically designed amateur equipment, and the use of well designed and well located repeaters, the amateur's life has become a very easy one. One wonders if the modern ham can possibly become as enthused as the older members of the fraternity who originally produced their own equipment!

"Admittedly, in some respects, today's carphones are similar to the 522 sets of yesterday, however, one fears many amateurs may never wish to operate anything more than what is really a glorified telephone (a function which it satisfies well), as contacts are so easy to obtain. Additionally, the repeater systems are often abused by people pushing sub-standard signals through the device, despite the consequent poor reports from other operators.

"Amateurs were originally those who developed and experimented with new radio communication techniques. In today's society, such is no longer possible because of the commercial exploitation of wireless that followed the initial development. However, amateurs are still the experts of propagation effects and there are many keen experimentalists in this field, e.g. moonbounce, and meteor scatter. Amateurs are also providing mobile

emergency communications through bodies such as WICEN. In this sense, we are a unique group in the community as we understand how communication "works" and thus we can exploit our system far more fully than other groups of communicators."

"We can only hope in the current shortage of radio spectrum that we can continue to justify our existence and preserve our frequencies for the amateurs of the future."

"Never you considered trying a little harder and producing a signal which will allow some degree of experimentation and not just sufficient to key the local repeater?"

A few comments from me. Everything Mike has said is only too true. The amount of VHF activity at present on both 8 and 2 metres, other than FM, is appalling. One needs only to look at the VHF notes in the quite large number of publications currently being produced in Australia to realise there is just about nothing to pass on for about 9 months of the year. VK5 must surely take the lead for the lowest degree of activity of anywhere in Australia, particularly on 2 metres, and I would be fairly safe in betting that it is not because of equipment building! One needs only to look at the small display of equipment brought to our WIA members equipment night each year in August to realise practically nothing in the way of home constructed equipment is being shown. A few such gatherings like the VHF Convention on the June holiday weekend in Mt. Gambier, which was held for the 10th time this year. Despite scores of VHF amateurs attending, only a very very small display of home constructed equipment is tabled. Yet, if one looks outside on such occasions, dozens of cars have transmitting antennas mounted there-on, and connected to commercial gear.

So I think Mike is right on the bell when he pleads for some signals in areas of the bands which allow for some experimentation. And less anybody, in VK5 particularly, likes to start pointing any fingers in my direction let the facts be put right. I have struggled to keep this column going for quite a few years now with not much help from the amateur fraternity as a whole, with a few exceptions. Particularly has it been difficult during the past two years due to homework and exams for the Colour TV course. I have been doing, and will be doing, until the end of this year, three times in succession I have was one of the section prizes for home constructed gear (all VHF oriented) at successive WIA Annual members equipment nights for equipment constructed between school lessons, a little bit of band listening, and still keeping the home base burning. At present I am constructing a 432 MHz transverter, and a transmitter for 576 MHz. So lay that pen down!

The other editorial is contained in the September 1976 issue of the Geelong Amateur Radio Club Newsletter, headed "TV on NOT TV" above the name of Daryl R. St. John, VK3AQD.

"The Australian TV system is possibly the most unorthodox in the world. In 1958 when TV was first started, we had a selection of 10 TV channels (1 to 10). A few years later, as the channel situation was generally found to create problems and proved unsatisfactory, a 12 channel system was substituted. Besides adding three new channels, 6, 5A and 11, we had to alter Ch. 1, 4, 5 and a slight shift to Ch. 10. Now with FM broadcasting around the corner, it appears that within the next year or two we will have to vacate Ch. 3, 4, 5 and 6 as we are to use the international FM bands (80-108 MHz). "This will involve another shift in TV frequencies, also that Ch. 5A which is adjacent to our very popular 2 metre band, may be used more commonly for TV. As most, or I should say all amateurs know, the six metre band creates all sorts of problems to channel 0 and vice-versa. Recently, over the VK3WBN broadcast, the facts regarding Ch. 5A have been released. To the amateur, it appears that we may be "pushed" out of our popular 2 metre band, similarly to the 6 metre situation.

"It is time for us to lobby together, and discuss the 2 metre band problem at clubs, over the air, and to our local member of Parliament. It is ridiculous for a "young" country like ours to have two changes, from the original TV system in 16 years . . . and what is next? UHF? All local TV manufacturers have been advised to provide switching for UHF converters for future installations . . . A further TV frequency change?

"The best TV system proposed to date, appears

to be a VHF Channel 8 upwards, for country areas because of the range and propagation conditions and UHF for capital and main cities, because of lack of interference from power lines, vehicles, co-channels etc. Aerials should be cheaper too with UHF, due to smaller size etc."

"It is time to now look into the problem. Look at the troubles associated with the shift in FM channel's on 3 metres. What happens if we have to possibly vacate the entire band? Many 2 metre FM repeaters are located on the site of TV transmitters. Receiver problems, and additional expense to repeater groups will undoubtedly occur if SA was introduced. So far here in Victoria, we have not been allocated a Ch 5A, but in other states, especially Queensland and NSW, Channel 5A licences are pending.

"I believe that in Townsville the channel 3 ABC station will be changed to 5A (2 metres), and a local repeater to serve a suburb on Ch. 1 (6 metres) in other words, possibly splitting no 8 or 2 metres activity from the Townsville area!

"Look out; keep up the SSB on 52, and 144 MHz. Use FM and repeaters correctly, and give some thought..."

If that doesn't prick the consciences of many amateurs I don't know what will. It was a great tragedy when we lost the 100 MHz and 144 MHz in the early 70's. Much further apart from the majority of the rest of the world, in particular, with our neighbours most likely to come within range at certain times. Many worthwhile contacts over years have no doubt been lost because of the 2 MHz difference. Similarly if we get pushed up to the last 2 MHz of 146 to 148 we will be isolated with a vengeance. A 2 metre 5MHz civ for 144 operation is an almost worthless device 2 MHz away, particularly higher, so the chap on the other end on 144 in New Zealand, as an example, is never likely to hear you, nor you him. And has it ever occurred to those who have never operated on the lower end of 2 metres that if we lost all the 2 metres band, you would really have to start doing some construction work and produce 432 MHz gear (if we still had that band!) because not much commercial equipment is around suitable for conversion to 432 or 440 MHz.

Finally, before the subject is changed, it appears to me that no real amateur of amateur originally concerned with the wooly VHF types who have the full licence is obtained, simply take up amateur operation on the HF bands. There is room on our bands for all kinds of operations but don't let any of us become too narrow in our operating circle.

CHRISTMAS UPDATES

Despite my requests for information of proposed portable operation during the Christmas-New Year break, nothing has reached my desk, so presumably no one is going out except me! Well! I guess I can take up my flying around 0700 instead of working other portable stations during those periods of coastal ducting and inversions. However, not quite as I lost, as Kerry VK5SU did write to me with some information on proposed operation from Ceduna this coming DX season. Kerry advises the VHF beams are being rebuilt or overhauled. On 6 metres he will run CW/SWB 40 watts PEP output, AM/FM 20 watts output. All modes to a 4 el. yagi at 54 ft 2 metres. CW/SWB 20 watts PEP output, AM also available, up to 11 el. yagi at 80 feet. He mentions that even with this low power he was successful in working to Sydney and Canberra last year. FM 10 watts output to a 10 element vertical polarized yagi at 57 feet, and when home available. Repeater on New 1, 2, 3, 4. Old Ch. 8. New Channel 50. He will be looking for contacts through the Adelaide and Albany repeaters, and further shield if possible. FM will also be monitoring either Ch 50 or Ch 8 when home, and amateurs passing through Ceduna would be welcome. Thanks Kerry, for going to the trouble of writing. Would be pleased to hear from you again soon.

THE TOWNSVILLE SCENE

A letter from Ron VK4ZLC, Publicity Officer of the Tigrisville Amateur Radio Club, indicates the repeater is progressing slowly. They are hoping to be allocated Ch. 1. The Club has been busy holding raffles, dinner dances etc. to raise funds for the repeater. It is hoped to site the repeater on Mt Stuart, alongside the TV station. Mt. Stuart is situated about 5 miles west of the town with a

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whit. or 3/8 in. UNF thread	
Brass tip chuck	\$2.00

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good lookout both north and south and only slight reduction in coverage to the west. Present proposals are for a 25 watts solid state repeater possibly more power later.

About 35 amateurs are now capable of radiating on Ch. 80 in the Townsville area and the majority also capable of Ch. 40. On 8 metres local rates are on \$3.02 Sunday mornings, while Ross VK4RC at Ayr (80 miles south) and Mario VK4ZMS (70 miles north) have regular checks on \$2.010 SSB. It is hoped there will be some signals available on 144 MHz for the coming DX season, as this may be the last opportunity for a while (due to propagation) or forever (if we lose 144-148) while working the northern VK4 boys from the southern areas.

THE VICTORIAN YNFer

The "QRT" edition of the above reached my desk recently very sorry indeed to see it go, it has contained a wealth of information within its pages. In its rather short life, features given are not of suitable articles, many printing and paper costs and postage charges. All valid points. Originally I was brainchild of Bob VK3AOT, that great exponent of the art of VHF, and later carried on by Ian VK3YAY, and supported by all too few at the working end, I am sure will regret the demise of such a worthwhile contribution to the VHF scene. May I voice my lone thanks to those associated with its production, and mention I still have on file every copy of the "VHFer". And they will be kept for the future. A job well done, boys.

Similarly, looks like some production difficulties for the Sydney based publication "BUP". Issues have been few and far between of late, again I expect for the same reasons in Victoria. All too few willing to help with production, costs high etc, changing home demands of already overworked personnel and so on. However, hope you can keep going for the time being Roger, VK2ZTF, your style is different, and you don't mind being controversial, certainly no yes man!

While on the subject of publications, once again I thank all those clubs and public officials who continue to send me copies of their newsletter with such regularity. Although I don't write back personally, there just isn't time at present, believe

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their receipt is appreciated, and I feel it would be a sorry day when they ceased to arrive.

That's probably enough for this month, looks like a few grousing aired etc but all in a good cause. I could add more, but won't. Closing with the thought for the month "We have too many people who live without working, and we have altogether too many who work without living". And did you hear about the translator-radio manufacturer — he's so outstandingly successful he's looking for smaller premises!

The Voice in the Hills.

Awards Column

with BRIAN AUSTIN VK5CA
P.O. Box 7A, Crows Nest, SA 5152

ITU "DIPLOME DES 198" AWARD

Secretary General M. MILI of the International Telecommunication Union has announced the establishment of an award for radio amateurs and shortwave listeners in recognition of their efforts to promote international goodwill through amateur radio. Known as the "Diplome des 198", the award will be given to any amateur who submits proof of contact with stations in 100 different member-countries of the ITU, or to any SWL who proves reception of amateur stations in same. Only contacts made on or after January 1, 1967, or after a country's ratification or accession to the Montreux convention, whichever is later, may be counted.

Only stations using frequencies, emission modes, and call signs which are in accordance with the ITU Radio Regulations may be logged or contacted for purposes of this award. There will be no endorsements for special conditions, but stickers will be given for each ten additional Administrations contacted or logged.

Administration of this award has been delegated to the International Amateur Radio Club (AUIRTC), Geneva. Requests for further details should not be sent to Geneva but should be mailed, with a self-addressed stamped envelope, to the IARU Award

Manager L. M. Rundell K4ZA, 206 East Amhurst St. Sterling Park, VA 22170. The application fee is 10 IRCs or \$2.

DIPLOME 35 (AHC)

The Section 35 (Ile et Vilaine, of REF, France, issues this certificate to licensed amateurs and SWLs all over the world.

1 Licensed amateurs need contact with five different stations located in the department 35, Ile et Vilaine, France

2 SWLs need send reports to 5 stations as above.

The Award is issued separately for (a) HF bands and (b) VHF bands. Contacts may be made using any mode of transmission.

An exchange of RS(T) and QTH is obligatory.

Contacts to mobile portable stations located in department 35 are valid provided their exact location is indicated on the QSL cards.

QSL cards are not required to be submitted.

Licensed amateurs apply with a copy of the station log, signed by the applicant. SWLs apply by enclosing a copy of their SWL licence and the QSL cards to the 5 stations of department 35.

Cards 8 IRCs

These rules are valid as from January 1969.

Address for the application:

Jean-Yves Rioult F5JU
11 Square de Provence

35 - Rennes, France

DYL CERTIFICATE

A certificate is now available for those persons showing proof of contact with YLs in the GERMAN FEDERAL REPUBLIC. The requirements are DX stations outside EUROPE work 10 women amateur radio operators with a licence of the German Federal Republic. A QSL of a YL working at a club station (DKD or DL0) counts extra if this QSL and the persons QSL of the YL show different dates. All bands and all modes of emission are acceptable. This award is available to SWLs as well as amateur radio operators. Stickers are awarded for each addition, 10 contacts.

Send GCRlist, together with 10 IRCs, or equivalent postage of your own country, to the Catholic Ursula Burper, 12 Furbergstr., 563 Potsdam, Germany/Europe.

This award will be sent by airmail.

Hamads

FOR SALE

AWA MR10C, complete with Ch. B, \$55. O.M.O. Hebreco HF AM Transceiver, x10 locked, suitable for 160 metres. \$10. Complete Microphone duplex system comprising of 110 VK3ZQF, 94 Dendy and plenty of spare parts, \$110. VK3ZQF, 94 Dendy and Middle Brighton, Vic. \$188. Ph. (03) 92 5667 A.H.

Getee G222TR AM-CW 80-10 meter Tx with handbook, \$75. 20 foot dual self supporting portable Mast in canvas bag, \$12. Various radio transmitters, \$10. Various power supplies, valves, HT chokes, blowers, amplifiers, tuning capacitors, and other equipment parts for best reasonable offer. VK3UG QTHR. Ph. (03) 231 2026 after 7 p.m.

HAM-M Rotator, as new \$120. Mast 60 ft - 5 section, built on type by Hills. \$50. Telepointer Cred-TC good working order. \$30. Power Supply - 500V/500mA stabilised. Dura, Tubing, various diodes and lengths. Pyre Mark 3, converted to 6 m. \$340. C.P.O. tube VK8NE OTHR.

Tessy Station, consisting of FDX-400 with 45 C.F.M., 1m attached, and spare 4K20s. FDX 400 vFO, FTI 650 and SP20, matching speaker. \$550 but open to any reasonable offer or will separate units to sell. VK2RR, QTHR Ph. (092) 46 3322.

Halfordians SK 117 Rx - Hf 44 Tr - P-S and speaker. 80-10 SSB-CW-AM VFO-PFT 120 PEP. Good condition. All new valves and new spans. 6D50 Q.S. \$320 or offer. L. A. Lawson, 77 Hill Ave., Burleigh Heads, Qld. Ph. (07) 35 2638 day, 35 2640 nigh.

Trix TR28 144-148 MHz AM Transceiver 240V/12V P.P. Inbuilt, separate VFOs for Tx/Rx, also self locked 1 xtal for 144.25 MHz. Mic handbook, good condition, \$150. OMO VK7ZOA, 65 Brougham St West Launceston, Tas. 7250. Ph. (03) 31 8643.

Drake TR4 Transceiver with AC P.S. Excellent condition with mini speaker. Spare part Fins. Tubes VK2GAQ OTHR. Ph. (02) 43 2427.

Galaxy 8 Transceiver SSB 80, 40, 20, 15 28-30, complete with P.S. spkr, mike, manual and full circuit, very good condition, \$350. OMO VK3FO QTHR. Ph. (054) 75 2245. AH (054) 2378.

Pyr 8 MHz xtal inter with carrier slot \$25. Cellline PTO FFO 75A series, \$20. Pyro Reporter 53 532 MHZ AM TA CR, \$15. Contact 5302 5 MHz TXCR, \$10. TCA FM 100 W base, \$40. 100W Zero Bias 807s Modulator, \$40. PBS 566A 800V \$600 mA, \$40. Several Command Receivers, \$15 each 3.5-4 MHz Receiver, \$10. Tx, 3.5-30 MHz CW, AM, 150W, built-in PSU (still used on CW) "mini mini" VFO H/bands \$65. WAT 1 & 2 male converters \$10 each for Hf, \$30. 220 VAC 10A 2800 VA 2800 VA 16-10 MHz, 2 x OY/25 PA, 2 x OY/35/25 mode, also recently operating RFDS, suitable linear or bits; also transformer 240-7 KV7 V.B.A. and HV chokes \$64. Offers to VK4OH, 20 Alfred St, Charleville, Q. 4470.

Ampex Sales Night. Moorsbriar 8 District Radio Club. To be held on "Fridays" Sat. 16th/17th/18th 1974, at the Moorsbriar baseball clubhouse, "Summit" Ave., Moorsbriar, at 8 p.m. Quantities, new and slightly used VHF and UHF FM solid state mobiles and portables. Enquiries, to Treasurer: John Emery, VK3YCD, Ph. (03) 783 6000.

Transmitters - 2 of AT14 100W AM, 2 x 813 PA, 2 x 807 PA, 2 x 250 MHz, 2 of AT306 300W AM, 1 x 10-10 MHz, 2 x OY/25 PA, 2 x OY/35/25 mode, also recently operating RFDS, suitable linear or bits; also transformer 240-7 KV7 V.B.A. and HV chokes \$64. Offers to VK4OH, 20 Alfred St, Charleville, Q. 4470.

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AWA MR725A with xtal, inc. \$2.525. 4MHz. \$100. AWA MR725A with xtal, 461 A, B & F, \$128. Pyre MR110 with xtal for 55.000 MHz, \$12. Complete set of RT & HF coils for AR820, what offers? VK2XJX, QTHR. Ph. (02) 798 9021.

FT200/FP200 combination with xtal for 28.8 and 27.0 installed. Smart black fascia, 12 months old and as new, \$270. VK2BBD Ph. (02) 839 7215.

ESTATE LATE VK2ASU. 40 ft 3 leg gal steel tower complete with prop, pitch meter, motor mounting plate with Selwyn motor attached, 28 ft 2" drive shaft gal pipe, top bearing, side ladder, platform mounts, 8 ft x 2" heavy aluminium twin boom, duralumin tubing. This tower will support any beam. \$165 OMO, VK2AFN, QTHR. Ph. (02) 76 9525.

SWAN 350 SSB Transceiver with DG and AC PSs in excellent condition with manual VOX xtal calibrator, \$320. VK2ABU, QTHR. Ph. (02) 212 1523.

A H. or 32 5216. Bus

FT101B, new in caron, used 3 times only, \$470.

P. Gibson (P29LL), Flat 104, 150 Mill Point, South Perth

Pye 280x Carbene, com. in SS chs A, B, C 1 and 4 (old) Boards in 25W Plus untried 50W board Needs attention, \$120. AWA MR10C SS PSU, all cables inc. ch. (4) (old) and B \$45. Kingsley AR-7 HF Calibrator, \$10. VK3YGY Box 41, P.O. Castlemaine 3450.

GEN KP282 2 metre transceiver, \$120. Ch B, 1, 4, 144.6, 144.8 10W amp to suit above. \$20. VK2SCS, QTHR. Ph. (02) 85-5324.

Channel 3 states for MRG etc, \$10.00. Wanted stats for Channel 2 VK3TG 2 Willow Cr., Kyabram 3620 Ph. (058) 52 1536.

Celline 7553 Rx min. condition, unmodified, little used \$550 OMO. Also antennas THG and 18AVG VK3ARD, QTHR. Ph. (03) 46 3594 A.H.

WANTED

14 AVG in good condition. Part exchange 4 band, 3 element "mini beam" in good condition. VK2BBD Ph. (02) 939 7215.

Amateur band or General coverage Rx, write R. Jacob, 42 Koitho St, Livingston, NSW.

FT200/FP200 combination. Price and particulars to R. Norman, VK5SW OTHR. All replies answered. GDO with coverage up to 2 metres. VK3ZTA, QTHR.

Bandpasser, Webster, mobile all band HF antenna. VK6QR, 16 Harrington Way, Hollamars, 6001 Ph. (092) 43924H.

18 AVT vertical or similar Price etc to VK3YGY Box 41, P.O. Castlemaine 3450.

20 Years Ago

with Ron Fisher VK3OM

NOVEMBER 1954

"Should We Hold a Region III Congress?" This Institute was fast becoming aware of the need for an International approach to the problems facing the Amateur Service Even in 1954 intruders in the exclusive amateur bands were common. The battle continues today. The question of reporting modulation quality was one that came up from time to time. With the RST system firmly established by this time, an RSM system was proposed by the RSGB. The "M" was to denote modulation quality on a 1 to 5 basis with "unintelligible modulation at the lower end and 'good' modulation not exceeding 100 per cent" at the higher end.

Ray Jones VK3RJ in his Federal QSL Bureau Notes reports on one of the most interesting cards he had ever handled. The card from KF3AB located on Fletcher Ice Island in the Arctic, confirmed a QSO with Chas VK1AC on Macquarie Island. In a letter accompanying the QSL, the writer Lloyd Hull claimed that the QSO is recorded as no other pole to pole contacts had previously been made.

Technical articles in November 1954 Amateur Radio included. The New "Look" in Frequency Modulation, part two — the receivers by John VK2AFN. Part two of "The Cospicule" by Tom Atthey VK4AU, dealing with small gauge gauges, "How to Make a Crystal Oscillator" and "Jack Daniels VK2CF described the "New Oscillator Circuit". This was later known as the Robert Dollar circuit.

A "stop press" item announces that South Australia has won the 1954 RD contest with Western Australia a close second.

Silent Keys

ERN HODGKINS — VK2EN

FRED ORRAD — VK2AHX

The month of July 1974 brought sorrow to the Central Coast Radio Club

First, the passing of Ern VK2EH and in the same week, Fred VK2AHX

Ern was one of the old-timers and was licensed in 1934 but held one of the early Experimenters Licences prior to that. He spent the greater part of his life in the Technical Education Department and resided on the Central Coast for many years.

Wherever Ern went he was active in the Amateur Radio Field and for a number of years operated the Morse Tape Service and regularly took his place on the nighty-morse practice session on 50 metres.

In this capacity he assisted many present Hams to obtain their licences and go ned great pleasure from doing so.

He was a past president of the Central Coast Club and held office of some kind the whole time he was a member. Ern became ill a couple of years ago and had to relinquish a lot of Ham activities. He passed away after an operation in Gosford Hospital in early July.

Fred Orrad VK2AHX was another of the old-timers, first being licensed in 1937. He was a PHM operator in the air raid days and later was attached to the electrical branch of the department.

Since moving to the Central Coast, Fred was a stalwart member of the Radio Club and always a willing worker.

Although mainly a DX man Fred was well known on the local scene on VHF since retiring. He was a friend to everyone and his shack door was always open to visitors in true Ham style.

The Central Coast Radio Club will be much the worse for loss of these members' passing and extend sincere sympathy to their loved ones.

Their calls will no longer be heard — but, they will be remembered.

Dick Maillard, VK2BK

LEW MACDONALD, VK2WU, s/o of 29 Main Street, Charlestown, passed away on 31 August 1974 aged 65 years.

Up to the time of his death he was an active member of the Hunter Branch of the NSW Division.

Lew obtained his Amateur Licence on 13th May 1930 and a Broadcast ticket in October 1938. He also obtained a 1st Class Commercial operator's certificate in March 1937.

Lew will be remembered by many amateurs for his assistance and instruction in helping others to obtain their amateur Novice.

To his family and friends we extend our deepest sympathy.

Ray Leben, Hon. Secretary, Hunter Branch

ALEX STEWART VK2AFX

The many friends of Alex Stewart were sad to hear of his passing and his obituary on 2nd September. Alex first entered Ham radio in the late 1950s in Tasmania, and later Tumut, as VK2AFX. He later spent many years in the radio section of Gisborne but relinquished his call sign when on a long tour of duty overseas. His health caused him to return and he came back to the JARL as VK2AFX. Alex, always kept fine vehicles and two transceivers, suited to parts of the 70's band, and a short calf generally "raised" him if not already in a net. Many Hams attended his funeral and he will be sadly missed by many who, like myself, have known him many years.

VK2BG

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THE NEW KENWOOD TRIO TS-520 — \$500**Specifications:**

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2. Built-in 7.2 volt DC power supply	11. Break-in CW with address	17. Antenned ALC	25. VFO indicator light
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5. Linear stable FET linear VFO	reliable with linear switch for	20. Built-in band channel operation	28. Carrying handle
6. Built-in noise blanker	mobile receive-only operation	21. Provision for use with a VHF	29. Internal cross-channel operation
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9. 8 pole crystal filter	accessory external speaker		
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Spectronics DD-1 counter for 101/401	\$150
FT DX 400/580 noise blankers,	\$20

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14 AVQ 10-40 M vertical 19 feet tall no guys	\$50
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AR-20, smallest model only for 2m beams	\$38
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Alt for 230 V AC with indicator-control units	

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Model XCR-30 Mk II 500 kHz to 31 MHz continuous coverage, crystal controlled reception of AM/USB/LSB/CW	\$250
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27 MHz NOVICE LICENSEE & CITIZEN-BAND EQUIPMENT

MIDLAND 5 W AM 23-channel transceivers complete with PTT mike all channel crystals 12 V DC op.	\$95
PONY 5 W CB-78 identical to Midland 5 W transceivers, \$95; CB-74 5 W AM with 27.880 xtal, fishermen	\$80
SIDEBOARD BRAND NC-310 one Watt hand-held transceivers \$80; SE-501 SSB/AM 15 W PEP SSB 23-channel transceivers, complete with PTT mike etc. 12V DC	\$175

144 MHz TWO METRE EQUIPMENT

MULTI-T solid state 24 channel FM 12V DC transceivers, 1 and 10W output, receiver with FET rf stage and mixer, equipped with crystals for TEN Australian channels Nos. 40, 42, 44, 46, 50, 54, 55, 58, 60, to be used either transceive or combinations repeaters and ANTI-repeaters, complete with PTT microphone, mounting bracket \$225	
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KEN PRODUCTS KP-202 hand-held 2 W output transceivers, now with 4 Australian channels, 40 & 50 plus a choice of 2 repeaters 42/54, 44/56, 46/58, 48/60 \$150; KCP-2 battery charger and 10 NICAD batteries \$35 Leather case for KP-202 \$5; Extra crystals for KP-202, two crystals per channel \$8	
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All prices quoted above will be subject to increases due to the 12% dollar devaluation, and expected price increases overseas, particularly for HY-GAIN antennas. Trading conditions are net, cash with orders, no terms nor credit available, no COD and no exceptions. Government & Public Company orders included. Add enough for freight, postage and insurance, all-risk insurance 50 cents per \$100.— value, minimum insurance charge \$0.50. Excess paid for freight and insurance will be refunded promptly . . . MARY & ARIE BLES, proprietors.

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PROJECT AUSTRALIS

STANDARD ORBITS — OSCAR 6

This set of Standard Orbits and the Ascending Nodes (the longitude in degrees West and the time in hours, minutes and seconds, G M T., of the satellite's path over the Earth, when it crosses the Equator, travelling into the Northern Hemisphere) is the only information needed to track OSCAR 6. It also allows calculation of when the satellite will be in range of the areas around other State capitals.

The morning (Southbound, at around 0900, local time) orbits over Australia have Ascending Nodes between 80 and 290 degrees West, while the evening (Northbound, at 2100 local time) orbits have Ascending Nodes between 150 and 275 degrees West. As a guide, the morning orbits will have smaller numbers at the start of the "ASCN NODE ADD MINS" column (between 58 and 82 minutes), than the evening orbits (between 86 and 104 minutes).

Ascending Nodes will be transmitted in Morse Code by the Codeset system on OSCAR 6 (29.45 and 435.1 MHz), and will also be announced on the weekly Divisional broadcasts.

If you are in or near Sydney, and want to track a (morning) orbit which has an ascension node of 359 degrees West at 2157 G M T., select the closest Standard Orbit from the Sydney set — 360 degrees West. Add 58 minutes to 2157 G M T., and you will hear the satellite at 2255 G M T. Time, azimuth and elevation points are given every two minutes on the Standard Orbits.

Because the satellite is in an almost circular (1460 Km), near-polar orbit, with each orbit being completed in 115 minutes, given one Ascending Node (say, 330 degrees West at 1905 G M T.), later Ascending Nodes can be determined by simply adding the distance in degrees which separates the orbits at the Equator (the Nodal Increment, 28.8 degrees), to 330 and adding 115 minutes to 1905 G M T. The result is, in round figures, 359 degrees West at 2157 G M T., for the next orbit.

To see whether the orbit which you are tracking in Sydney will be in range of Perth, look at the Perth Standard Orbit which corresponds with the orbit that you are following. If you are tracking an orbit with an Ascending Node of 359 degrees West and are using the 360 degrees West Standard Orbit for Sydney, OSCAR 6 will be in range of Sydney from 58 to 78 minutes after the Ascending Node (2255 to 2315 G M T., on the example above), a total of 20 minutes. The same orbit will be in range of Perth from 68 to 78 minutes after the Ascending Node (2305 to 2315 G M T.). Therefore, that orbit will be in range of both Sydney and Perth from 2305 to 2315 G M T., so that 10 minutes of contact through the satellite will be possible. By selecting an orbit that passes midway between Sydney and Perth (e.g., an Ascending Node of 25 degrees West), contacts of up to 18 minutes are possible. For contact with New Zealand, orbits to the East of Australia should be used, while for contacts into Asia, orbits in the North and West should be used.

Users of Standard Orbits should note that the sets of Southbound Orbits start towards the end of the set (315 degrees West for Sydney) and resume at the beginning of each set (0 degrees West for Sydney), ending near the middle of the set (45 degrees West for Sydney). They are then immediately followed by the first of the Northbound orbits (150 degrees West for Sydney). It was not possible in the short time available after the OSCAR 6 launch rocket was changed to put the Southbound orbits in continuous order.)

Assuming a launch at 1715 G M T. on 9th October, the first Ascending Nodes bringing orbits in range of Australia will be —

Orbit 1	324 W at 1842 G M T.	9/10/72 Southbound
Orbit 2	353 W at 2037 G M T.	9/10/72 Southbound
Orbit 3	22 W at 2232 G M T.	9/10/72 Southbound
Orbit 4	50 W at 0028 G M T.	10/10/72 Southbound
Orbit 8	166 W at 0809 G M T.	10/10/72 Northbound
Orbit 9	194 W at 1004 G M T.	1/10/72 Northbound
Orbit 223	223 W at 1159 G M T.	10/10/72 Northbound
Orbit 252	252 W at 1354 G M T.	10/10/72 Northbound

Any change in the OSCAR 6 launch date will alter the times, but not the longitudes of the Ascending Nodes. Any alterations will be notified on Divisional broadcasts.

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GENERAL

Frequency Range: 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz, 28.0-30.0 MHz, WWV 15 MHz (receive only).

Mode: Selectable USB, LSB, CW or AM.

Frequency Stability: Within 100 Hz during any 30 minute period after warm-up. Not more than 100Hz with 10% line voltage variation.

Calibration Accuracy: 2 KHz maximum after 100 KHz calibration.

Backlash: Not more than 50 Hz.

Antenna Impedance: 50 to 75 Ohm unbalanced nominal.

Circuitry: 32 Transistors, 9 FET, 6 Integrated Circuits, 52 Diodes and 3 Tubes.

Power Requirement: 100/110/117/200/220/234 V AC, 50/60 Hz, 380 Watts maximum, or 13.5V DC nominal, 6.7 A for standby, 0.7 A for

receive (Heater OFF) and 24 A for transmit.

Size: 340(W) x 153(H) x 285(D) mm.

Weight: 15 Kg.

RECEIVER

Sensitivity: 0.3 μ V for 10 dB Noise plus Signal to Noise Ratio on 14 MHz.

Selectivity: 2.4 KHz nominal bandwidth at 6 dB down, 3.8 KHz at 60 dB down on SSB, CW and AM. 600 Hz nominal bandwidth at 6 dB down, 1.2 KHz at 60 dB down with optional CW filter. 600 Hz nominal bandwidth at 6 dB down, 12 KHz at 60 dB down with optional AM filter.

Harmonic & Other Spurious Response: Image Rejection better than 50 dB. Internal Spurious Signal below 1 μ V equivalent to antenna input.

Automatic Gain Control: AGC threshold nominal 6 μ V. Selectable AGC time constant, fast or slow. Fast attack time 3 millisecond and slow attack

time 5 millisecond. Fast release time 0.35 second and slow release time 2 seconds.

Audio Noise Level: Not less than 40 dB below 1 Watt.

Audio Output: 3 Watts to internal or external speaker at 4 Ohm impedance.

Audio Distortion: Less than 10% at 3 Watts output.

TRANSMITTER

Input Power: 260 Watts PEP on SSB, 180 Watts on CW at 50% duty cycle and 80 Watts on AM. (Slightly lower on 10 meter.)

Microphone: 50 K Ohm dynamic type. **Carrier Suppression:** -40 dB.

Sideband Suppression: -50 dB.

Spurious Radiation: -40 dB.

Distortion Products: -30 dB.

Frequency Response: 300 Hz to 2700 Hz \pm 3 dB.

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